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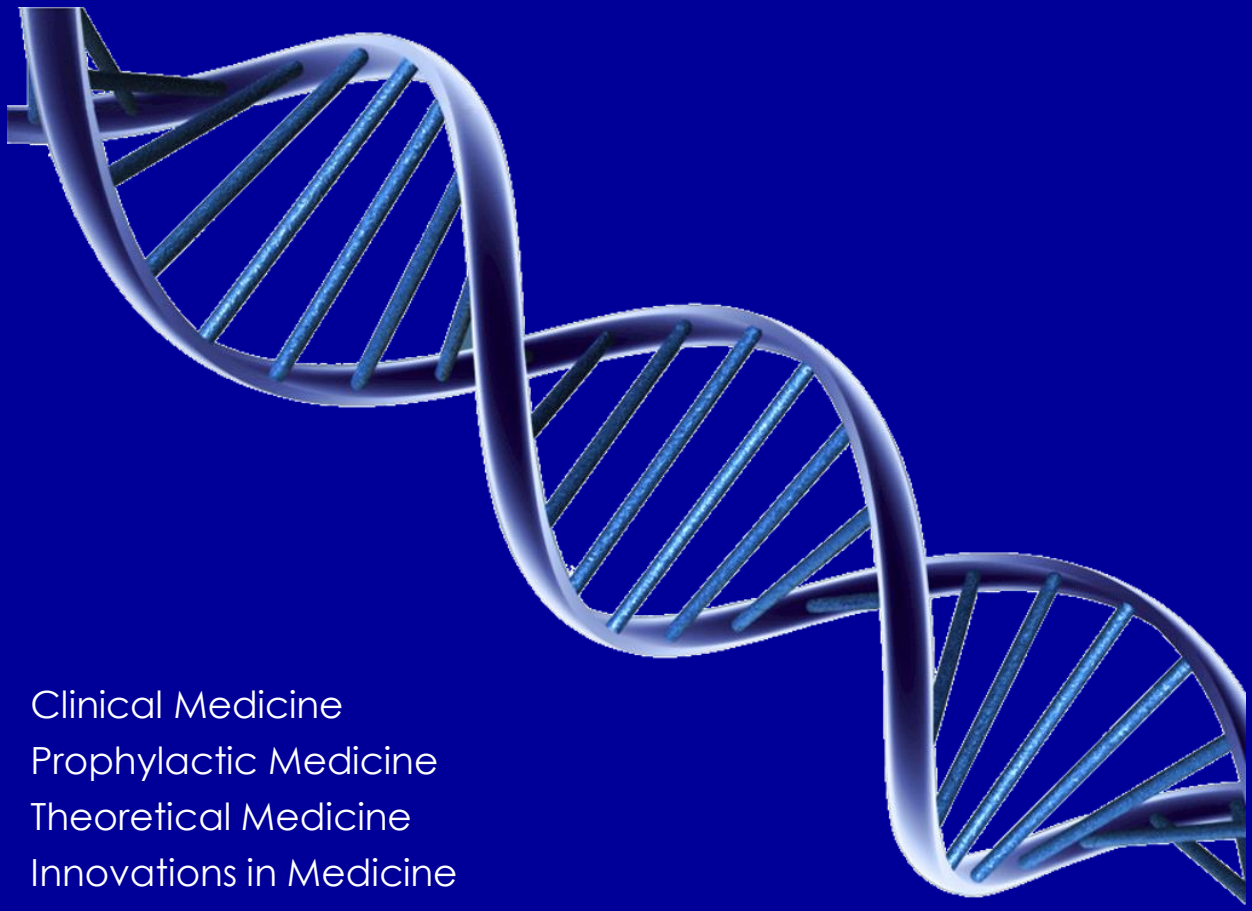

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RELATIONS BETWEEN ACNEIFORM SKIN, DAILY HABITS AND NUTRITION HABITS IN ADULTS

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ABSTRACT

Background
Acne is a chronic inflammatory disease of skin with high population ratio. Acne effects 85% of adolescants and young adults between 12 and 25 years. Acne was related to skimmed milk intake, high glisemic index food intake, fat intake, smoking, westerneised dietary, elevated body-mass index in the past in various clinical studies.

Objectives
The present study aims to evaluate the skin lesions of acne patients and relations of acne with gender, age, body mass index nutrition habits and some daily habits.

Material and Methods
Participants age, height, weight, smoking-alcohol use, Fitzpatrick skin phototypes, their acneiform skin properties, usual dietary habits, smoking and alcohol consumption were questioned and listed in a questionnaire form. Their body mass indexes were calculated.

Results
There were relations statistically significent between acne severity and fried potato consumption,egg consumption with gender differences (p<0,05). Also relations statistically significent between postacne hyperpigmentation and BMI, smoking, elevated bread consumption, red meat consumption with gender differences were observed (p<0,05).

Conclusions
Acne is related with multifactorial effects in life. Gender, nutrition, young age, height, weight, daily habitual dependences like smoking are some of these effectors but leaving of none of them can really cure acne alone at all.
Keywords: acne, dietary, nutrition, smoking, alcohol, egg.

Introduction
Acne vulgaris (av) is a process of inflamation of pilo-sebaceaus units with multiple severity levels. Acne levels can vary from comedones,papules,pustules, cyctic nodules and severe types leading to permanent scars. Acne effects 85% of adolescants and young adults between 12 and 25 years.[1,2] Bronsnick reported an association between acne vulgaris and consumption of milk or low-fat milk products.[3] Melnik et al. Reported that high consumption of high glycemic food products and milk lead to av processes pathology. High glicemic index foods are relatede with worsening of acne severity.[4-7] Positive relation between milk cunsumption and acne was reported. Choclate and salt consumption was not associated with acne improvement.[6] Some earlier

observational studies reported an inverse association between smoking and acne[9]. Recent studies have shown that smoking improves severe acne.[10] A change to westernised dietary from native dietary of people is considered to trigger acne formation[11]. Acne was also associated with increasing body mass index(BMI)[12], but also no evidence suggests that putting people on restrictive diets reduces acne. Also milk was associated with acne formation while whole milk containing estrogen was considred to effect reducing acne.[13] It's still hard to make recommendations to prevent acne.[14]

The present study aims to evaluate the skin lesions of acne patients and relations of acne with nutrition, consumed dietary products and some daily habits.

Materials and methods

Study design and population

Male and female patients who applied to outpatient clinic with acne problems in University of Health Sciences Izmir Tepecik Education and Research Hospital were included in our study group between January 2021 and August 2021. It was approved by the University of Health Sciences, Izmir Tepecik Training and Research Hospital Ethical Review Committee.

Those with other severe dermatologic diseases like psoriasis, vitiligo, bullous diseases, systemic steroid using patients, pregnant and lactating and younger than 18 years of age were excluded and weren't accepted in study. After obtaining consent from all participants their demographic characteristics, some skin properties were noted and questionnaire forms about dietary and daily life habits were filled.

Participants' genders, age, height, weight, smoking-alcohol use, Fitzpatrick skin phototypes, acne features on their skin, some dietary habits were questioned. Acneiform skin properties were classified as comedonal, papulopustular, nodulocystic and severe acne forms. Postinflamatuar hyperpigmentation degrees were noted as mild, moderate or severe.

Statistics

All statistical methods SPSS 17 was used for variables. Determination for normal distribution or not was done (Kolmogorov-Smirnov/Shapiro-Wilk tests). Spearman and Chi-square correlation tests were used for statistical analysis. *P values* of *less than 0.05 were* regarded as statistically significant.

Results

One hundred and twenty female (60%) and 80(40%) male participants were included in our study. Mean age in men was 23,03 (min 18- max 44) and 23,94 (min 18- max 36) in women. Average height 164,35±4,82 cm. in women and 177,90±6,64 cm in men and weight average It was found to be 54.61±4,25 kg in women and 76,66±6,4 kg in men. Mean BMI (kg/m^2)was in men 24,14 and 20,21 in women.There aren't any significant relations with age, weight, height , BMI values between men and women. Acneiform lesions were 18 comedonal (15%), 4 papulopustular (3,3%), 79 nodulocyctic (65,8%), 19 severe (15,8%); 20 comedonal (25%), 14 papulopustular (17,5%), 36 nodulocyctic (45%), 10 severe (12,5%) in men. Postacne hyperpigmentation was 100 mild (83,3%), 12 moderate (10%), 8 severe (6,7%) in women; 58 mild (72,5%), 12 moderate (15%), 10 severe (12,5%) in men. According to Fitzpatrick phototypes, 2 cases were phototype 1 (1,7%) 38 were phototype2 (31,7%), 78 were phototype 3 (65%), 2 were phototype4 (1,7%) of women; 25 were phototype 2 (31,3%), 55 were phototype 3 (68,8%) of men. One hundred and seven women didn't smoke (89,2%); 54 of men didn't smoke (67,5%). Scar due to acne was positive in 100

women (83,3%) and positive in 76 of men (95%). Bread consumption was positive in 112 women (93,3%) and was positive in all men group (100%). Butter and margarine consumption was positive in 4 women (3%), 60 positive in men (75%). Egg consumption was positive in 30 women (25%), and 58 positive in men (72,5%). Fried potato consumption was 52 positive in women (43,3%) and 61 positive in men (76,3%).Red meat consumption was 96 positive in women (80%) and 70 positive in men (87,5%)Fast food consumption was 100 positive in women (80%) and 71 in men(88,7%).

In men skin acne severity was in relation with egg cunsumption with a p value of 0,016 statistically significent. acne severity was related statistically significent with fried potato cunsumption in men with a p value of <0,01 in men group (Table 1). In men BMI was related statistically significent with post acne hyperpigmentation with p value of 0,007. There was relation between red meat intake and postacne hyperpigmentation in male gender with p value 0,016 statistically significent (Table 2).

There were a relationship between smoking and postacne hyperpigmentation in women with a p value of <0,001 and in men with p value of 0,008 statistically significent. In women postacne hyperpigmentation was in relationship with bread consumption with a p value of p 0,008 statistically significent. There was relation between fastfood intake and postacne hyperpigmentation in women with p value 0,001 statistically significent (Table 2). Other analyse results were summarised in table 2.

Discussion

In men skin acne severity was in relation with egg cunsumption with a p value of 0,016. There was no relation in egg cunsumption and acne severity in women. This may be a sign of feeding with fat rich foods can be triggerin factor in acne and sebum production. In men acne severity was in relation with fried potato cunsumption in men. This seems also controversial. Maybe fat intake between unfried or fried makes the difference.

In women acne severity and postacne hyperpigmentation was in relationship with bread cunsumption. This can show that high glisemic index can trigger acne severity and it's parellel to literature.

Melnik et al. Reported that high consumption of high glycemic food products and milk lead to av processes pathology. High glicemic index foods are relatede with worsening of acne severity.[4-7]

In men BMI was in related to post acne hyperpigmentation. Acne was also associated with increasing body mass in parallel with literature. [12]

There was relation between red meat intake and postacne hyperpigmentation in men. There was a relation between fastfood intake and postacne hyperpigmentation in women. Except these two conditions food intake and postacne hyperpigmentation was not related statistically. A change to westernised dietary from native dietary of people in Papua new ginea and Paraguay observed to trigger acne formation[11]

There were a relationship between smoking and postacne hyperpigmentation in both genders. This can be with a reason of antioxidant factor are decreased by smoking.This information is also parallel with literature despite the earlier studies.[9,10]

Conclusion

It's hard to set food recommendations to prevent from acne. Collection information about spesific foods must go on. Milk intake is thought to be a reason for acne but its distinction couldn't be

done whole milk or low fat milk or skim milk was a real trigger of acne. Elevated body mass index was considered as a trigger for acne bot limited diets for these people couldn't cure acne at all. Acne is a chronic inflamatuar skin problem and multifactorial treatments and life and nutrition habits are needed to decrease its severity. This study focused in specific possible factors of acne. More clinical studies are needed in acne etiology and prevention.

REFERENCES

1. Seattle WI. Global Burden of Disease (GBD) Compare. Seattle: University of Washington; 2013.
2. Bodle L, Hunger RE, Seyed Jafari SM. Comparison of teledermatological examinations with conventional office visits in management of acne vulgaris: A review of current literature. J Cosmet Dermatol. 2022 Aug;21(8):3292-3299. doi: 10.1111/jocd.14641. Epub 2021 Dec 3. PMID: 34859946.
3. Bronsnick T, Murzaku EC, Rao BK, et al. Diet in dermatology: part I. Atopic dermatitis, acne and nonmelanoma skin cancer. J Am Acad Dermatol. 2014;71(6): e1-1039.e12.
4. Suva, Manoj. (2015). A Brief Review on Acne Vulgaris: Pathogenesis, Diagnosis and Treatment. Research & Reviews: Journal of Pharmacology. 4. 1-12.
5. Davidovici BB, Wolf R. The Role of Diet in Acne: Facts and Controversies, Clin Dermatol 2010; 28(1): 12–6p.
6. Ferdowsian HR; Levin S. Does Diet Really Affect Acne? Skin Therapy Lett 2010; 15(3): 1–5p.
7. Smith RN, Mann NJ, Braue A, et al. The Effect of a High Protein, Low Glycemic Load Diet versus a Conventional, High Glycemic Load Diet on Biochemical Parameters associated with Acne Vulgaris: A Randomized, Investigator Masked, Controlled Trial, J Am Acad Dermatol 2007; 57(2): 247–56p.
8. Melnik BC. Evidence for Acne Promoting Effects of Milk and Other Insulinotropic Dairy Products, Milk and Milk Products in Human Nutrition, Nestlé Nutr Institute Workshop Series: Pediatr Prog 2011; 67: 131–145pp.
9. Mills CM, Peters TJ, Finlay AY. Does smoking infl uence acne? Clin Exp Dermatol 1993; 18: 100–01.
10. Klaz I, Kochba I, Shohat T, Zarka S, Brenner S. Severe acne vulgaris and tobacco smoking in young men. J Invest Dermatol 2006; 126: 1749–52.
11. Cordain L, Lindeberg S, Hurtado M, Hill K, Eaton SB, BrandMiller J. Acne vulgaris: a disease of Western civilization [comment]. Arch Dermatol 2002; 138: 1584–90.
12. Tsai MC, Chen W, Cheng YW, Wang CY, Chen GY, Hsu TJ. Higher body mass index is a signifi cant risk factor for acne formation in schoolchildren. Eur J Dermatol 2006; 16: 251–53.
13. Shah J, Parmar D. A Complete Review on Acne Vulgaris. J Adv Med Dent Scie Res 2015

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A FUZZY CO-CLUSTERİNG ALGORİTHM FOR BİOMEDİCAL DATA

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ABSTRACT

In order to increase the accuracy of clustering biomedical data, fuzzy co-clustering extends co-clustering by applying membership functions to both the objects and the characteristics. In this research, we provide a novel information bottleneck-based fuzzy co-clustering algorithm called ibFCC. The distance between a feature data point and the feature cluster centroid is calculated using the information bottleneck theory by the objective function called the ibFCC. Using five biomedical datasets, numerous experiments were done, and the ibFCC was compared to well-known fuzzy (co-)clustering algorithms as FCM, FCCM, RFCC, and FCCI. According to experimental data, ibFCC could produce high-quality clusters and was more accurate than any of these approaches

Introduction

The volume of biological data is expanding quickly today, making it challenging for patients and medical professionals to get the information they require. The clustering technique is useful for restructuring large-scale biomedical data and assisting users in finding pertinent information since it can reveal the latent structure and knowledge hidden within them. In order to create a set of clusters, this method aims to maximize intra-cluster similarity while minimizing inter-cluster similarity. It is frequently used for tasks like automatically classifying text, gathering gene expression data, and others [1,2].

Several scholars have explored data mining in recent years and have developed various clustering techniques [3–7]. Hard and soft clustering techniques can be used to categorize these algorithms [8].

The scientific community has done substantial research on hard clustering and generally agrees with it. An automated two-level variable weighting clustering approach for multiview data, for instance, was proposed by Chen et al. [9] after studying hard clustering and simultaneously computing weights for views and individual variables. Unlike soft clustering, which allows objects to belong to multiple clusters, hard clustering restricts each object to only one cluster. For instance, thyroid surgery and endocrinology can be divided into two clusters for nodular goiter. Another illustration is that various physicians may classify the atypical hyperplasia as normal or bad endometrium. Because we frequently can't fit an object into just one cluster, the aforementioned examples show us that soft clustering may be more rational than rigid clustering.

Statement of the problem

Fuzzy clustering, which is viewed as the fusion of clustering and fuzzy sets, must be discussed when discussing soft clustering. It is not very old to use fuzzy clustering. The Fuzzy c-Means (FCM) algorithm, a fuzzy variation of the conventional K-Means clustering technique, serves as a representation of it. The primary distinction is that the FCM is a soft algorithm, whereas the K-Means is a hard method. In other words, whereas in FCM the memberships take values in the actual unit interval [0, 1] [10,11], K-Means reflects the affiliation of objects to clusters by

memberships taking values 0 and 1. The FCM is hence the fuzzy iteration of the K-Means. On the other hand, the K-Means can be seen as a particular instance of the FCM.
The FCM is hence the fuzzy iteration of the K-Means. On the other hand, the K-Means can be seen as a particular instance of the FCM. FCM has recently been created by researchers. In order to combine the clustering results from each view, Jiang et al. [12] investigated how to do so and suggested the collaborative fuzzy c-means (Co-FCM) algorithm.
FCM is a kind of one-dimensional clustering algorithm That is, when grouping the contingency table of disease symptoms, FCM assumes that there is no relationship between symptoms and classifies disease based on symptoms only. We actually know that some diseases can have a mutual influence, for example, there is a close relationship between high pulse pressure and various metabolic diseases As this is the case, it is unscientific not to notice the connections between the symptoms If the disease symptom contingency table is considered unrepresentative, we can discuss a more typical example, which is the document-word matrix Likewise, when analyzing a document-word matrix, it's best to think about word associations, because as everyone knows, some words are synonyms and some are antonyms So it can be seen that when we analyze the entity attribute contingency table for clustering, we need to cluster both entity and attribute dimension. As a result, two-dimensional fuzzy clustering algorithms, called fuzzy co-clustering algorithms, are better than one-dimensional FCM, especially when there is strong correlation between features.
Approximate joint clustering can cluster objects and features simultaneously for information about events together [13-15]. This results in more relationships between items and properties are preserved so we can get more interpretable cluster results At the same time, because the functions are also decomposable in feature clusters, which means that the feature dimensions are low the connection process will be greatly accelerated Many fuzzy clustering algorithms have been introduced so far. FCCM (Fuzzy Clustering for Categorical Multivariate Data) [14] is the best known fuzzy co-clustering algorithm which can be considered as one two dimensional FM extension. Other important fuzzy joint clustering algorithms are FCR (fuzzy coclustering with Ruspini condition) [16], FCCI (fuzzy joint clustering with Ruspini condition) [16], FCCI (fuzzy clustering).
Image Co-Clustering Algorithm) [17], PFCC (Possible Fuzzy Co-Clustering) [18], RFCC (Robust fuzzy clustering) [19] and SS-HFCR (heuristic semi-supervised fuzzy co-clustering algorithm)[20] and others. To compare these algorithms, we first explain the mathematical notation used in this article. With mathematical notation, The objective functions of some of the popular fuzzy clustering algorithms mentioned above are presented.
The FCCI algorithm is one of the most important fuzzy co-clustering algorithms. The algorithm includes a multidimensional distance function as dissimilarity and entropy as a regularization term in its objective function. The FCCI emphasizes the importance of the distance function, which is equal to the square of the Euclidean distance between a feature data point and the centroid of a feature cluster. However, we all know that there are many similarity measures in the field of data mining and pattern recognition [21]. Previous work by us and others has shown that similarity measures based on information bottlenecks are the better choice. Because this similarity measure far outperforms other measures of clustering and can achieve much higher accuracy. In a study by S. Noam and T. Naftali, experimental results showed that the average performance for all datasets reached a precision of 0.55, with the second best result being a precision of 0.47.

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presented a new alternative clustering algorithm called SmIB that uses mutual information to measure the information contained in the data, and experimental results show that the SmIB algorithm outperforms existing state-of-the-art alternative clustering algorithms demonstrated was shown to existence algorithm.

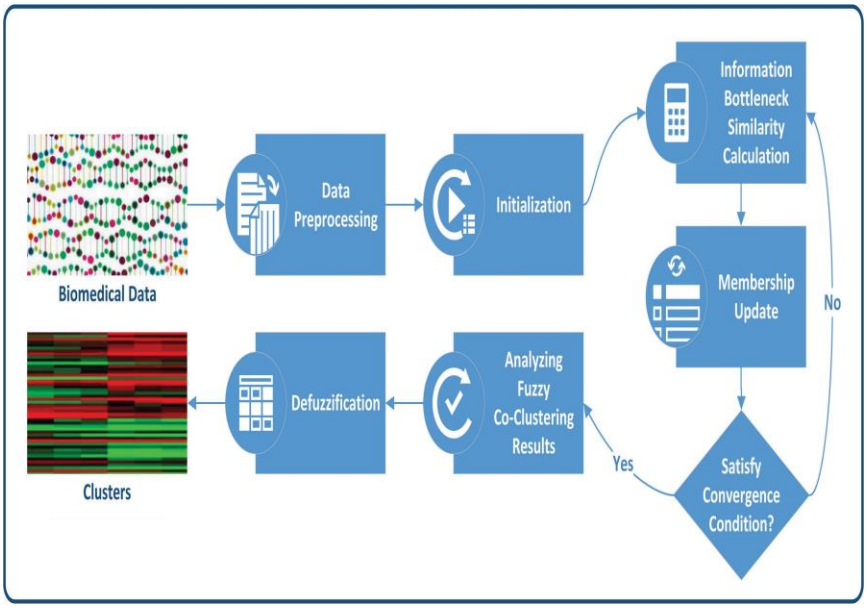
The above analysis motivates us to present a novel fuzzy co-clustering algorithm based on the information bottleneck similarity measure called ibFCC. This approach assigns membership functions to both objects and features. Moreover, biomedical data come in many different formats, making it difficult to choose just one suitable method for computing pairwise object similarity. We believe similarity measures based on information bottlenecks are much more appropriate. ibFCC formulates an objective function containing a distance function that measures the similarity between feature data points and feature cluster centroids using information bottleneck theory.

The rest of the book is organized as follows. We first presented ibFCC in detail, then presented experimental results on five datasets: Ohsumed, lung cancer, breast tissue, electrocardiogram, and mouse protein expression increase. Finally, finish your work.

Solutions

Method

Since the distance function is very important for fuzzy co-clustering to produce richer co-clusters [17], FCCI includes the Euclidean distance function of the feature data points from the feature cluster centroids in the co-clustering process. However, as you know, there are many distance measures besides the Euclidean distance function, and it is difficult for users to choose the right one. In many cases this is an arbitrary choice. If we look at clustering, we find that distance measures based on information bottlenecks are much better. Therefore, our proposed ibFCC algorithm uses information bottleneck theory to measure the distance between feature data points and feature cluster centroids. The overall clustering process is shown in Figure 1.



Algorithm1.ibFCCalgorithm.
1: Set values of parameters C, T_u, T_v maximum error limit ξ and the maximum num- ber of iterations parameterτ_{max}
2:Setτ=1
3:Initialize membershipsu_{ci}andv_{cj}randomly
4:REPEAT
5: Calculatethevalueofp_{cj}usingEq12
6: Calculatetheinformationbottleneckdistanced_{cij}usingEq11
7: Updatemembershipv_{cj}usingEq8 8: Updatemembershipu_{ci}usingEq7 9: Setτ++
10:UNTIL$max(|u_{ci}(\tau)$-$u_{ci}(\tau$-1)|)$\leq\xi$or$\tau=\tau_{max}$
The ibFCC pseudocode shows that the time complexity of ibFCC is O(CNKτ). Where τ represents the number of iterations. Its time complexity is comparable to fuzzy co-clustering algorithms such as FCCM and FCCI with O(CNKτ).

Algorithm effectiveness tests
A series of experiments were performed to test the effectiveness of ibFCC. Experimental results are also compared to four well-received approaches in the literature, FCM, FCCM, RFCC, and FCCI. Of the four algorithms, FCM is the standard fuzzy clustering algorithm and the others are fuzzy co-clustering algorithms.
Experimental device. Five datasets were used to evaluate the performance of ibFCC in classifying data from real-world, Ohsumed, lung cancer, breast tissue, electrocardiogram, and mouse protein expression. 1) The Ohsumed corpus is a collection consisting of the first 20,000 documents from 50,216 medical abstracts in 1991. The classification scheme consists of 23 medical subject heading (MeSH) disease categories. Based on the Ohsumed corpus, we created two subsets Oh1 and Oh2 shown in Table 3. For experiments using the Ohsumed corpus, we selected the 500 most significant features. H.K=500
1) The lung cancer (LC) dataset, used by Hong and Young, shows the power of the optimal discriminant plane even in poorly placed settings. It contains 27 instances and 56 attributes. We used existing taxonomies as the basis for how to cluster the dataset.
2) Using a corpus of breast tissue (BT), the original six-class or four-class classification can be predicted by integrating the fibroadenoma, mammary gland, and glandular classes. Discriminated against). Contains 106 instances and 9 attributes. 3) In the Cardiotocography (Card) dataset, 2126 fetal electrocardiograms (CTGs) were automatically processed to measure the diagnostic features of each. The CTG was also classified by her three experienced obstetricians, each assigned a consensus classification label.
5) This mouse protein dataset [deleted]MPE) contains a total of 1076 measurements per protein. Each measurement can be considered an independent sample/mouse. Her eight classes of mice have been described based on traits such as genotype, behavior and treatment.

Results
Hierarchical clustering. In hierarchical clustering algorithms, cluster data are grouped using a sequence of nested partitions from individual clusters to clusters containing all individuals or vice versa. The former is called cohesive, the latter divisive. Agglomeration process: Use a bottom-up approach. Start each object as a separate cluster and merge them into successively larger clusters.

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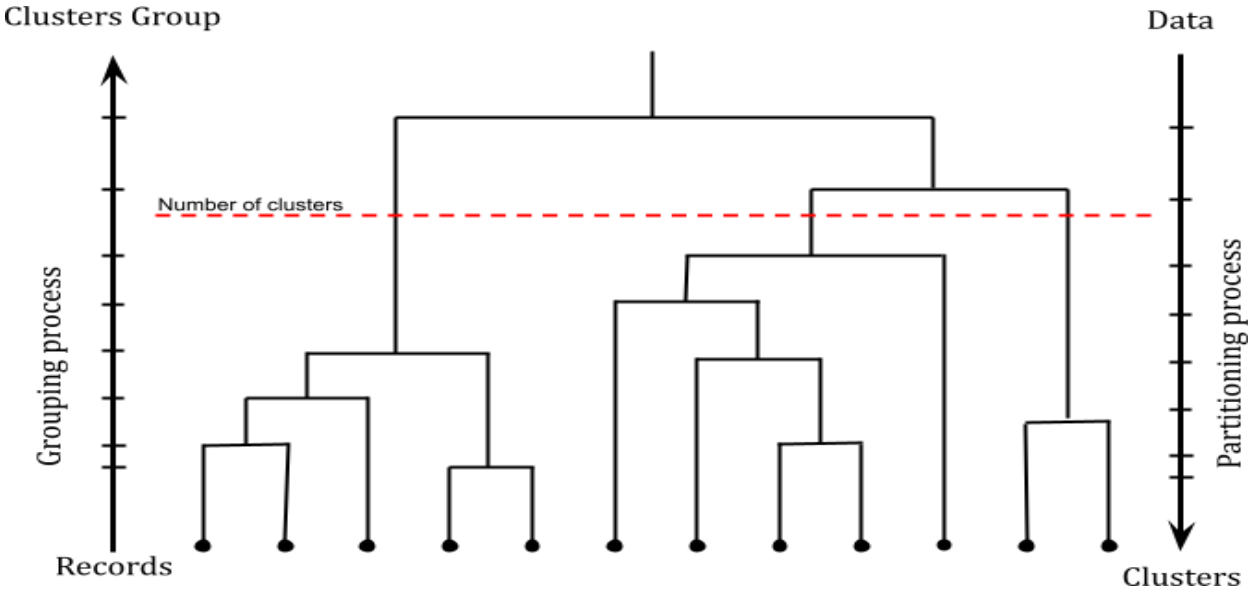
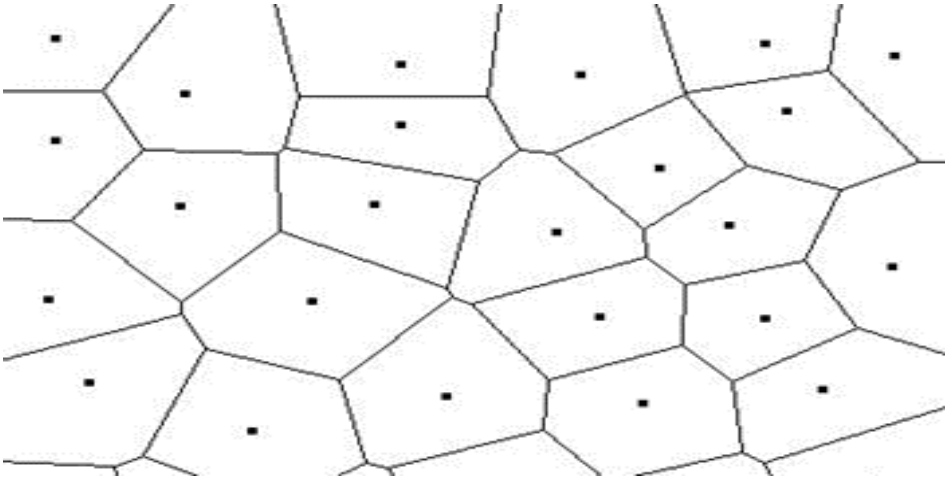
Division method

On the other hand, it uses a "top-down" approach. Start with the entire set of objects in a cluster and split it into successively smaller clusters. Figure 4 shows the difference between the two approaches in the process direction. In practice, agglomeration methods are commonly used, while splitting methods are limited due to their prohibitive computational load. The output of hierarchical clustering when visualizing big data is usually displayed as a dendrogram or Boroni diagram (such as Figure 5). It clearly shows the proximity between data objects and their clusters, providing a nice visualization. Traditional hierarchical clustering methods are conceptually easy to understand, but have the drawback of being very computationally complex.





This high computational burden limits its application in large-scale data sets [15]. Many algorithms fall in this cat- egory such as Chameleon [16], ROCK [17], LIMBO [18],

Partition-based clustering

In the partitioning-based algorithms, all clusters data is recur- sively divided into some partitions until the partition criterion reaches a specified value, and here each partition represents a cluster. K-means, and K-medoids are most famous algorithms based on partitioning. K-means iterative update the centre of the cluster until coverage data. Some versions of K-means has been proposed in the way to improve time com- plexity. Other algorithm's fall in this category, such as PAM, CLARA, CLARANS, COOLCAT and Squeezer.

Density-based clustering

The density clustering aims to discover the shapes of the clusters. In this type, the data are numerical so that they can be grouped based on dimensional distances. Initially, data divided into three types of points: core, boundary, and noise points. The point considered a core point if it has a least m points within distance n, the point considered a border if it has at least on core within range; otherwise, the point marked as noise. The algorithms work by grouping these points to form a density of the clusters. Algorithms fall in this category such as CACTUS, CLOPE, DBDC, and EBK-modes.

Probabilistic and Generative Clustering

Model-based algorithms cluster data based on various strategies such as statistical and conceptual methods. There are two general types of model-based algorithms:

Neural network approach and analytical approach. The neural network approach is a supervised technique. However, Kohonen's SOM is the model used for clustering. Algorithms such as SVC and Ensemble fall into this category. E. Grid-based clustering

Grid-based clustering algorithms have shown great interest in their ability to detect clusters of various shapes and sizes. There are two main methods for this type:

Fixup and adaptive grid partition scheme. The idea of the fixup grid partitioning scheme is to divide each dimension of the data space into equal lengths and intersect them into equally sized rectangular cells. Points within the same network belong to a group and are therefore treated as one object. All grouping is done on these grid cells. The idea of adaptive grid partitioning schemes is to divide the data space into non-intersecting grid cells of different sizes according to the distribution characteristics of the data, but the total number of grid cells is less than those of these fixup partitioning schemes significantly reduced. Nevertheless, determination of the spitting point required enormous computational power. CLIQUE, STING, WaveCluster, DEN-CLUE used a fixed-up grid method, but others, such as OptiGrid and MAFIA, used adaptive grid division methods.

Scalable clustering method

Explore some scalable clustering techniques. Traditionally, two different methods have been developed to process big data. First, these techniques focus on reducing the size of the data either vertically or horizontally (Figure 7), while other methods focus on speeding up execution, making them suitable for multi-physical processors depends. Using this technique, large amounts of data can be split into smaller pieces and processed simultaneously by different devices. Multi-machine clustering algorithms are categorized as follows:

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Figure 3. Clustering performance comparisons of FCM, FCCM, RFCC, FCCI and ibFCC in terms of clustering score on the six subsets.

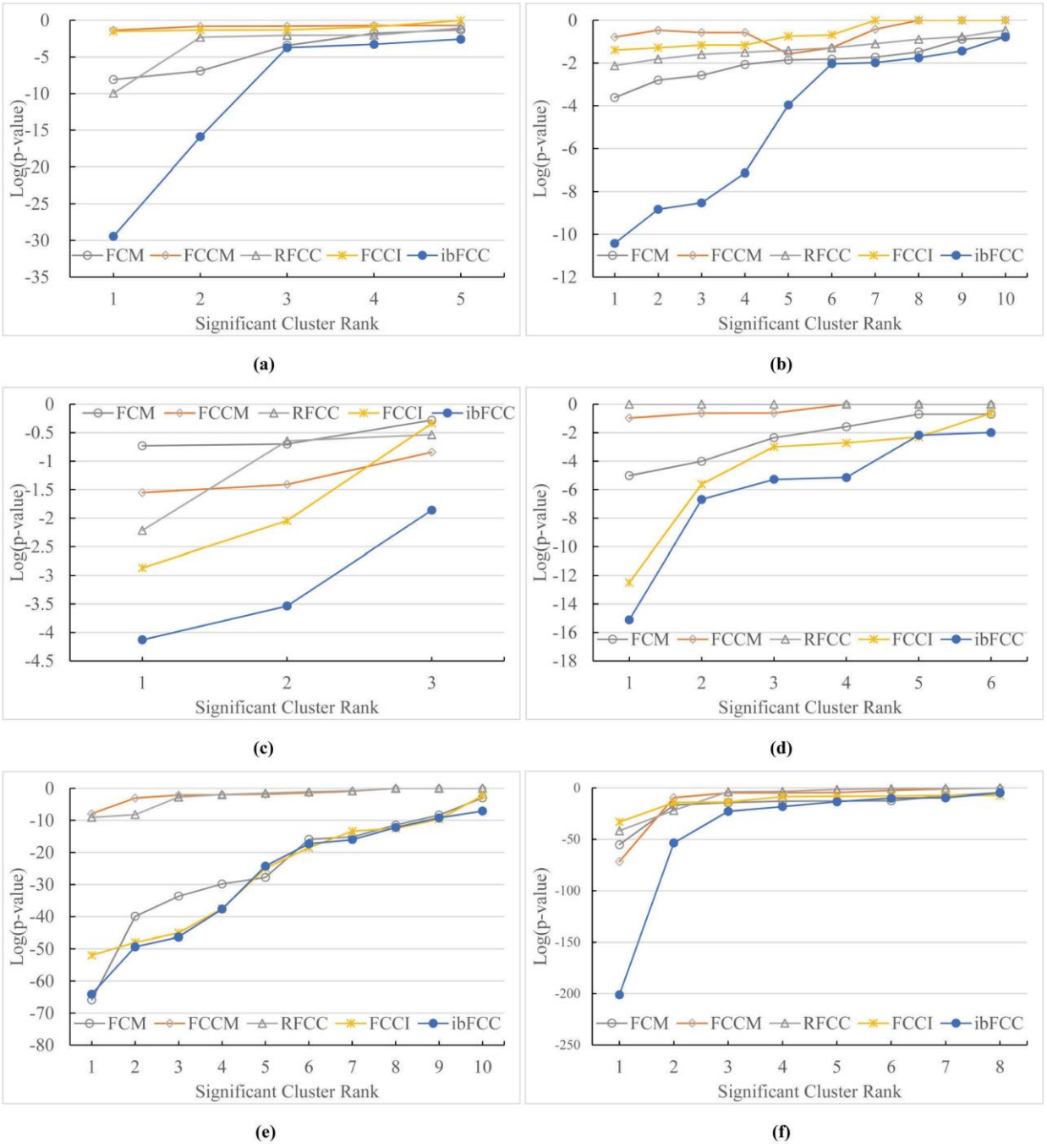

Figure 4. Comparisons of the five approaches on the 6 subsets in terms of p-value. (a) *Oh*1(b) *Oh*2(c) *LC*(d) *BT*(e) *Card*(f) *MPE*.

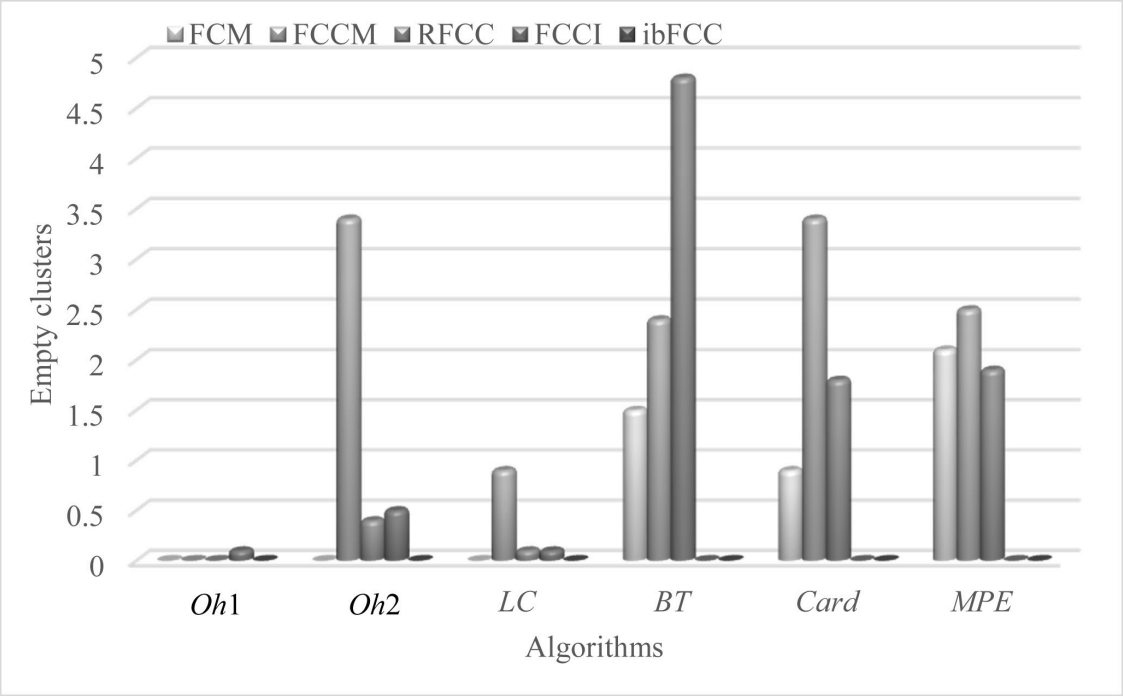

Figure 5. Comparison of our approaches and counterpart algorithms in terms of empty cluster number.

Besides the number of empty result clusters, execution time is also an important issue.
As mentioned earlier, the time complexity of ibFCC is O(CNKτ), which corresponds to fuzzy co-clustering algorithms such as FCCM, RFCC and FCCI. Even if the FCM algorithm implements fuzzy clustering instead of fuzzy coclustering, its time complexity is also O(CNKτ). However, the time complexity only dictates the conclusions of the theoretical analysis. To thoroughly compare these algorithms, we performed additional experiments to capture the clustering time. Table 4 shows the execution time each algorithm takes to complete the once-through clustering of each dataset. By comparison, we can see that the FCM algorithm is the slowest for the six data sets. The main reason is that the algorithm is sensitive to noise and slows convergence significantly. The other four fuzzy co-clustering algorithms look more complex, but they group both objects and features, which can greatly reduce feature dimensionality and improve clustering efficiency. This explains why fuzzy co-clustering algorithms outperform fuzzy.
Clustering algorithm. Comparing the four fuzzy co-clustering algorithms in terms of running time, we find that FCCM has the highest performance while ibFCC takes longer. The former is due to the very simple calculation procedure of FCCM and the latter is due to the complex similarity measure based on the information bottleneck of ibFCC. FCCI's similarity measurement is more complex than FCCM and RFCC, so it takes more time for FCCI to complete clustering. Similarly, ibFCC's run time is longer than FCCI's because ibFCC's measurements based on information bottlenecks take longer than FCCI's. Nevertheless, ibFCC is more efficient than FCM. In summary, ibFCC does not increase the theoretical time complexity, but achieves high clustering accuracy while encountering more real run time due to the similarity measure computation

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process. Therefore, how to further improve the actual driving efficiency will be the focus of future research.

Conclusion

Recently, several fuzzy co-clustering algorithms have been proposed. These algorithms retain the benefits of co-clustering and fuzzy clustering, while using fuzzy membership functions to improve the representation of overlapping clusters, greatly facilitating large-scale biomedical data reorganization.

The most commonly used of the existing well-known fuzzy co-clustering algorithms is the Euclidean distance function. However, distance measures based on information bottlenecks have been found to perform much better in many clustering algorithms. Therefore, in this paper, we propose a novel fuzzy co-clustering algorithm named ibFCC that includes an information bottleneck-based distance function in the objective function to measure the distance between feature data points and feature cluster centroids. To evaluate the performance of ibFCC, we conduct experiments on five biomedical datasets, Ohsumed, lung cancer, breast tissue, electrocardiogram, and protein expression in mice. Our algorithm has also been compared with several popular fuzzy (co)clustering algorithms and found to be more powerful.

Determining the number of clusters in the literature is difficult. Our research confirms that the value of C is still manually specified by the user and that ibFCC is not completely unattended. In the future, we plan to incorporate techniques to evaluate the number of clusters to optimize our approach.

REFERENCES

1. L. Kaufman and P. J. Rousseeuw, Finding Groups in Data: An Introduc- tion to Cluster Analysis, vol. 344. Hoboken, NJ, USA: Wiley, 2009.
2. J. Friedman, T. Hastie, and R. Tibshirani, The Elements of Statistical Learning, vol. 1, no. 10. New York, NY, USA: Springer, 2001.
3. M. W. Berry and M. Browne, Lecture Notes in Data Mining. Singapore: World Scientific, 2006.
4. S. H. Kaisler, F. J. Armour, A. Espinosa, and W. H. Money, ‘‘Big data and analytics challenges and issues,’’ 2014.
5. X. Wu, X. Zhu, G.-Q. Wu, and W. Ding, ‘‘Data mining with big data,’’ IEEE Trans. Knowl. Data Eng., vol. 26, no. 1, pp. 97–107, Jan. 2014.
6. D. Agrawal, C. Budak, A. El Abbadi, T. Georgiou, and X. Yan, ‘‘Big data in online social networks: User interaction analysis to model user behavior in social networks,’’ in Databases in Networked Information Systems, A. Madaan, S. Kikuchi, and S. Bhalla, Eds. Cham, Switzerland: Springer, 2014, pp. 1–16, doi: 10.1007/978-3-319-05693-7_1.
7. H.-L. Nguyen, Y.-K. Woon, and W.-K. Ng, ‘‘A survey on data stream clus- tering and classification,’’ Knowl. Inf. Syst., vol. 45, no. 3, pp. 535–569, Dec. 2015.
8. C. C. Aggarwal and C. K. Reddy, ‘‘Data clustering,’’ in Algorithms and Application. Boca Raton, FL, USA: CRC Press, 2014.
9. A. B. Bondi, ‘‘Characteristics of scalability and their impact on per- formance,’’ in Proc. 2nd Int. Workshop Softw. Perform. (WOSP), 2000, pp. 195–203.

10. D. C. Anastasiu, J. Iverson, S. Smith, and G. Karypis, ‘‘Big data fre- quent pattern mining,’’ in Frequent Pattern Mining, C. C. Aggarwal andJ. Han, Eds. Cham, Switzerland: Springer, 2014, pp. 225–259, doi: 10.1007/978-3-319-07821-2_10.
11. K. Jaseena and J. M. David, ‘‘Issues, challenges, and solutions: Big data mining,’’ in Proc. NeTCoM, CSIT, GRAPH-HOC, SPTM, 2014, pp. 131–140.
12. S. Shirkhorshidi, S. Aghabozorgi, T. Y. Wah, and T. Herawan, ‘‘Big data clustering: A review,’’ in Computational Science and Its Applications—ICCSA 2014. Cham, Switzerland: Springer, 2014, pp. 707–720, doi: 10.1007/978-3-319-09156-3_49.
13. D. Jayalatchumy, P. Thambidurai, and A. A. Vasumathi, ‘‘Parallel pro- cessing of big data using power iteration clustering over MapReduce,’’ in Proc. World Congr. Comput. Commun. Technol., Feb. 2014, pp. 176–178.
14. W. Kim, ‘‘Parallel clustering algorithms: Survey,’’ Parallel Algorithms, Spring, vol. 34, p. 43, 2009.
15. R. Xu and D. Wunsch, Clustering, vol. 10. Hoboken, NJ, USA: Wiley, 2008.
16. G. Karypis, E.-H. Han, and V. Kumar, ‘‘Chameleon: Hierarchical cluster- ing using dynamic modeling,’’ Computer, vol. 32, no. 8, pp. 68–75, 1999.
17. S. Guha, R. Rastogi, and K. Shim, ‘‘Rock: A robust clustering algorithm for categorical attributes,’’ Inf. Syst., vol. 25, no. 5, pp. 345–366, Jul. 2000.
18. P. Andritsos, P. Tsaparas, R. J. Miller, and K. C. Sevcik, ‘‘LIMBO: Scalable clustering of categorical data,’’ in Advances in Database Technology—EDBT 2004, E. Bertino, S. Christodoulakis, D. Plexousakis, V. Christophides, M. Koubarakis, K. Böhm, and E. Ferrari, Eds. Berlin, Germany: Springer, 2004, pp. 123–146, doi: 10.1007/978-3-540-24741-8_9.
19. R. Bahgat, M. A. Mahdi, S. E. Abdel-Rahman, and I. A. Ismail, ‘‘Frequency tree for clustering categorical data with similarity measure based on items’ weights,’’ in Qatar Foundation Annual Research Forum, vol. 2012, no. 1. Doha, Qatar: Hamad bin Khalifa Univ. Press (HBKU Press), 2012.
20. M. Li, S. Deng, L. Wang, S. Feng, and J. Fan, ‘‘Hierarchical clustering algorithm for categorical data using a probabilistic rough set model,’’ Knowl.-Based Syst., vol. 65, pp. 60–71, Jul. 2014.
21. H. Qin, X. Ma, T. Herawan, and J. M. Zain, ‘‘MGR: An information theory based hierarchical divisive clustering algorithm for categorical data,’’ Knowl.-Based Syst., vol. 67, pp. 401–411, Sep. 2014.

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THYROGLOSSAL DUCT CYSTS SURGERY OUTCOMES

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ABSTRACT

Objective
Thyroglossal duct cysts are the most common congenital neck mass in the midline of the neck. Cystic formations develop due to the partial or complete lack of obliteration of the thyroglossal duct. It may lead to transformation to malignancy, although rarely. Our study aims to discuss the outcomes, examination findings, clinical features, and treatment methods of 51 patients operated on for thyroglossal duct cysts to contribute to the literature.

Methods
The 51 cases that underwent surgery (Sistrunk, Cystectomy, Thyroidectomy) with a preliminary diagnosis of thyroglossal duct cyst in ENT and HNS clinics were evaluated retrospectively. The patient's sociodemographic data, main complaints, examination findings, diagnostic methods, surgical techniques, recurrence and complication rates after treatment, and pathology results were analyzed in this study.

Results
Of the 51 patients, 35 (69%) were adults, and 16 (31%) were children. The most common reason 40 (78%) for admission was swelling in the midline of the neck, less commonly 8 (16%) swelling under the chin, 4 (8%) of patients with an average follow-up of 28 months (max 32; min 8; SD 3 months) were performed revision operations. Surgical treatment has consisted of the Sistrunk procedure (n = 47; 92%), cystectomy (n = 4; 8%), or thyroidectomy (n = 1; 2%). Papillary thyroid carcinoma was diagnosed in 2 (4%) patients, and medullary thyroid carcinoma was in 1 (2%) in our cases. They were no significant differences in gender and age, sociodemographics data.

Conclusion
Thyroglossal duct cysts should be considered in the differential diagnosis of patients presenting with swelling in the midline of the neck. Sistrunk operation, a safe surgical procedure with the least recurrence rate and a low risk of complications, is recommended as surgical treatment.
Keywords: Thyroglossal duct cyst, Midline neck mass, Sistrunk operation

Introduction
Congenital neck masses constitute 12% of all neck masses. The most common neck midline masses at 70-80% are thyroglossal duct cysts (TGDC) or fistulas (1-4). TGDC occurs as a result of partial or complete lack of obliteration in the thyroglossal duct during the descent of the thyroid gland from the tongue base (foramen cecum) to its anatomical position in embryogenic development (1,2,4,5). A thyroglossal fistula is formed if the duct opens directly to the neck skin. It can generally occur along the midline of the neck and in the thyrohyoid (60%), suprahyoid

(25%), suprasternal (13%), and intralingual (2%) regions, respectively (2,5). Sex predominance is not observed (5-7). Although it is common in childhood and adolescents, it can occur at any age (1,6). TGDC usually presents with different clinics that are soft, well-circumscribed, fluctuating, painless, mobile, and occasionally changing in volume in the midline of the neck (3,5,8). The mass's movement and the tongue's protrusion during swallowing are pathognomonic in clinical examination. However, ultrasonography (USG), computed tomography (CT), magnetic resonance imaging (MRI), thyroid scintigraphy, thyroid function tests (TFT), and fine-needle aspiration biopsy (FNAB) are recommended to confirm the diagnosis, determine the presence and localization of normal thyroid tissue, and show malignant degeneration in the cyst (1,5). Although the clinical course of TGDC is benign, malignant transformation can rarely be observed (8).
This study aims to contribute to the literature by discussing, in light of the relevant articles, examination findings, clinical features, and surgical and treatment methods of our patients who were operated on with the pre-diagnosis of thyroglossal duct cyst.

Figure 1. Excised thyroglossal duct cysts.

Methods

Patients who were operated on (Sistrunk, Cystectomy, Thyroidectomy) at the ENT and HNS clinic with a preliminary diagnosis of TGDC between January 2008 and January 2019 were retrospectively analyzed. The patients' demographic data, age, sex, chief complaints, comorbidity, examination findings, diagnostic methods, surgical techniques, clinical aspects of the long-term follow-up period, recurrence and complication rates after treatment, and pathology results were investigated and evaluated in light of the literature. Among the analyzed data, more attention was

taken to current problems such as the effect of socioeconomic level on the operation time, the place of gender and age difference in TGDC, the reasons affecting the recurrence in surgery, and the effect of total removal of the hyoid bone on the recurrence.

Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) version 18.0 (SPSS, Chicago, IL, USA). Continuous variables are presented as means ± standard deviation (SD), while discrete variables are presented as numbers and percentages. *P*-value < 0.05 is considered statistically significant.

Results

We have evaluated 51 patients with TGDC preliminary diagnosed and operated on from January 1, 2008, and 1, January 2019, a totally 24 months follow-up. 23 (45%) were men, 28 (55%) were women, 35 (69%) were adults, and 16 (31%) were children. The mean age was 30 (SD ± 18; median 25), with a range of 3-78 years. The most common reasons for admission were swelling in the midline of the neck 40 (78%), swelling under the chin 8 (16%), difficulty in breathing 2 (4%), and cosmetic defect in 1 (2%). USG, neck CT with contrast, and neck MRI were used for definitive diagnosis. Scintigraphy was applied to check the presence of thyroid tissue in the cyst. Four (8%) of patients with an average follow-up of 28 months (max 32; min 8; SD ± 3 months) were performed revision operations. The average cyst size is 2.8 cm (range 0.8-8.7 cm) by imaging (Figure 1.). The size of the cyst was determined to be smaller in pediatric patients than in adults. Surgical treatment consists of the Sistrunk procedure (n = 47; 92%), cystectomy (n = 4; 8%), or thyroidectomy (n = 1; 2%). Papillary thyroid carcinoma was diagnosed in 2 (4%) patients, and medullary thyroid carcinoma was in 1 (2%) in our cases. In 4 (8%) patients, the cause of the recurrence in surgery was subtotal removal of the hyoid bone. Among the analyzed data, there was no significant difference in the effect of socioeconomic level on the operation time, the place of gender, and age difference in TGDC.

Discussion

Thyroglossal duct cysts (TGDC) are seen equally in both genders every decade of life, especially in childhood (9). In our series of patients, 23 (45%) were male, 28 (55%) were female, 35 (69%) were adults, and 16 (31%) were children, similar to the literature. Thyroglossal fistulas had occurred in advanced decades. Thyroglossal duct cysts are mostly asymptomatic. Approximately 50% of TGDC have a history of infection of the cyst or fistula at specific intervals. Admission is made to ENT polyclinics with this complaint by patients (9-11). The most common reasons for admittance of our cases were swelling in the midline of the neck 40 (78%), less commonly under the chin 8 (16%), following difficulty in breathing 2 (4%), and cosmetic defect 1 (2%).

As TGDC is midline mass, the differential diagnosis should be made with a dermoid cyst, thyroid pyramidal lobe, thyroid adenoma, thyroid carcinoma, aberrant thyroid tissue, branchial cleft cyst, lipoma, lymphadenopathy, hemangioma, lymphangioma, laryngocele, and teratoma in neck pathologies (8,12,13). Computed tomography (CT), magnetic resonance imaging (MRI), USG, and thyroid scintigraphy, TFT values can be used in the definitive and differential diagnosis of thyroglossal duct cysts (14). It should be kept in mind that there is rarely a risk of malignant transformation (8,15-18). Papillary thyroid carcinoma was diagnosed in 2 (4%) patients, and medullary thyroid carcinoma was in 1 (2%) in our cases.

The treatment of thyroglossal duct cysts is usually surgical, and the Sistrunk operation is most commonly performed. Sistrunk procedure (n = 47; 92%), cystectomy (n = 4; 8%), and

thyroidectomy (n = 1; 2%) were preferred as surgical treatment methods in our cases. There are many reasons for the unsuccessful surgical treatment of thyroglossal duct cysts. 4 (8%) of patients with an average follow-up of 28 months (max 32; min 8; SD 3 months) performed revision operations. It is thought that subtotal removal of the hyoid bone and surgical technique are the reasons for this.

Conclusion

In light of this knowledge, thyroglossal duct cysts should also be considered in differential diagnoses of patients with swelling or mass in the neck. Sistrunk surgery is the gold standard for its treatment.

REFERENCES

1. Ahuja AT, Wong KT, King AD, Yuen EH. Imaging for thyroglossal duct cyst: the bare essentials. Clin Radiol. 2005;60:141-8.
2. Wadsworth DT, Siegel MJ. Thyroglossal duct cysts: variability of sonographic findings. AJR Am J Roentgenol. 1994;163:1475-7.
3. Lin ST, Tseng FY, Hsu CJ, Yeh TH, Chen YS. Thyroglossal duct cyst: a comparison between children and adults. Am J Otolaryngol. 2008;29:83-7.
4. Al-Khateeb TH, Al Zoubi F. Congenital neck masses: a descriptive retrospective study of 252 cases. J Oral Maxillofac Surg. 2007;65:2242-7.
5. Mondin V, Ferlito A, Muzzi E, Silver CE, Fagan JJ, Devaney KO, Rinaldo A. Thyroglossal duct cyst: personal experience and literature review. Auris Nasus Larynx. 2008;35:11-25.
6. Johnston R, Wei JL, Maddalozzo J. Intra-thyroid thyroglossal duct cyst as a differential diagnosis of thyroid nodule. Int J Pediatr Otorhinolaryngol. 2003;67:1027-30.
7. Brousseau VJ, Solares CA, Xu M, Krakovitz P, Koltai PJ. Thyroglossal duct cysts: presentation and management in children versus adults. Int J Pediatr Otorhinolaryngol. 2003;67:1285-90.
8. Almuradova.E, Şimşir I.Y, Erdoğan.M, Çetinkaya.Ş, Saygılı.F, Özgen A.G . İshal ile başvuran bir medüller tiroid kanseri olgusu: MEN 2B sendromu. Ege Tıp Dergisi. 2017;56;sayı 3;160-161
9. Telander RL, Deane SA. Thyroglossal and branchial cleft cysts and sinuses. Surg Clin North Am 1977; 57: 779-791.
10. Benner KG, Organ CH Jr, Williams GR. Is the treatment for thyroglossal duct cysts too extensive? Am J Surg 1986; 152: 602-605.
11. Sanders LE, Cady B. Embryology and developmental abnormalities. In: Cady B, Rossi RL, eds. Surgery of the thyroid and parathyroid glands. Philadelphia: W.B. Saunders, 1991: 5-12.
12. Athow AC, Fagg NL, Drake DP. Management of thyroglossal duct cysts in children. Br J Surg 1989; 76: 811-814.
13. Josephson GD, Spencer WR, Josephson JS. Thyroglossal duct cyst: the New York Eye and Ear Infirmary experience and a literature review. Ear Nose Throat J 1998; 77: 642-4, 646-7, 651.
14. Sturgis EM, Miller RH. Thyroglossal duct cysts. J La State Med Soc 1993; 145: 459-461.

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15. Lei JY, Zhang YH. Thyroglossal cysts carcinoma: A case report. Chin Med J 1988; 101: 141-142.
16. Colloby PS, Sinha M, Holl-Allen RT, et al. Squamous cell carcinoma in a thyroglossal cyst remnant: A case report and review of the literature. World J Surg 1989; 13: 137-139.
17. Vincent SD, Synhorst JB. Adenocarcinoma arising in a thyroglossal duct cyst: Report of a case and literature review. J Oral Maillofac Surg 1989; 47: 633-635.
18. McNicoll MP, Hawkins DB, England K, Penny R, Maceri DR. Papillary carcinoma arising in a thyroglossal duct cyst. Otolaryngol Head Neck Surg 1988; 99: 50-54.

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POSTOPERATIVE PAIN AND MULTIMODAL ANESTHESIA IN ABDOMINAL PLASTIC AND BARIATRIC SURGERY

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ABSTRACT

Any rational anesthesia strategy should focus on intraoperative and postoperative pain control. Adverse effects of opioids on the course of the early postoperative period are known.
The aim of our study is to determine the correlations of acute postoperative pain with different types of anesthesia.

Methods

203 patients who underwent abdominal plastic and bariatric surgery were under our observation; 113 (55.67%) of them are women and 90 (44.33%) are men; Among them, 154 patients underwent abdominoplasty, and 49 underwent bariatric surgery.
Standard anesthesia with opioids was administered to 49 (24.14%) patients - group I, multimodal + partial use of opioids - group II: 76 (37.44%), multimodal anesthesia - 78 (38.42%) - group III.

Results

During anesthesia with opioids, compared to the second and third groups, the pain in the operative area, as well as in the head, throat, waist and ears is significantly higher.
During multimodal anesthesia, pain is reliably less in all cases, and pain in the throat was not noted. Correlation analysis showed that opioid anesthesia was significantly correlated with postoperative pain,: Pain in the operated area - $r=0.504^{**}$, $p<0.001$; Head pain - $r=0.395^{**}$, $p<0.001$; Throat pain - $r=0.301^{**}$, $p<0.001$Waist pain$r=0.320^{**}$, <0.001, Muscles pain - $r=0.422^{**}$, $p<0.001$
whereas multimodal anesthesia was significantly negatively correlated with all types of postoperative pain.
In the second phase, in the opioid anesthesia group, compared to the second group, there is significantly more pain in the lower back and muscles, and in the third group, there was no pain at all.
The frequency of patients who did not require medical treatment during the intrahospital stage is not significantly different from each other, and the pain requiring non-opioid treatment is significantly less after multimodal anesthesia - Group I - 28(57.14%), Group II - 25(32.89%), Group III - 2(2.56)($p<0.0001$). Pain requires opioid medication - Group I - 20(40.82)Group II – 19(25.00%), ($p<0.0001$). No patient in this group required opioid treatment.
In the ambulatory stage, no patient in the multimodal anesthesia group needed medical treatment, and significantly fewer patients in group II needed non-opioid treatment.

Conclusion

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Multimodal anesthesia reduces perioperative pain and the need for perioperative opioid use.
Keywords: Postoperative pain, Multimodal anesthesia, perioperative opioid use.

Abdominoplasty, with or without liposuction, is among the most frequently performed aesthetic procedures. Its main objective is to improve the body contour by means of excising redundant skin and fat tissue. Although abdominoplasty is considered a safe procedure with high satisfaction rates, intraoperative and postoperative complications can become a challenge for the surgical team. The aim of this article is to offer a synopsis of the most common complications arising after abdominoplasty, along with evidence-based guidelines about how to prevent and treat them.
Cognition is defined as the brain's ability to acquire, process, store, and retrieve information. Pain is described as an unpleasant sensory or emotional experience, and in order to consciously experience pain, cognitive processing is necessary[2]. The pain pathway consists of transduction, transmission, modulation, and perception [3].
Any rational anesthesia strategy should focus on intraoperative and postoperative pain control[4]. Adverse effects of opioids on the course of the early postoperative period are known. In addition to the traditional side effects of rats (depression of consciousness, excessive sedation, nausea, etc.), they have the ability to create opioid-induced hyperalgesia, and immunosuppressive effects and reduce the effect of local anesthetics; In addition, opioid analgesia prevents accelerated postoperative rehabilitation of patients. The concept of multimodal analgesia allows refusing the use of opioid analgesics or reducing their dose to a minimum in the perioperative period. Multimodal analgesia involves the simultaneous administration of two or more drugs that affect different levels of acute pain syndrome formation[5].
The use of traditional methods of general anesthesia and postoperative analgesia with a combination of narcotic and non-narcotic analgesics is accompanied by increased hemodynamic parameters - both during the operation and during the four days of the postoperative period [6].
Management strategy, anesthetic choice, and anesthetic doses must be adapted to the needs of the individual patient [7]
The aim of our study is to determine the correlations of acute postoperative pain with different types of anesthesia.

Methods
203 patients who underwent abdominal plastic and bariatric surgery were under our observation; 113 (55.67%) of them are women and 90 (44.33%) are men; 154 patients underwent abdominoplasty, and 49 underwent bariatric surgery.
Standard anesthesia with opioids was administered to 49 (24.14%) patients - group I, multimodal + partial use of opioids - group II: 76 (37.44%), multimodal anesthesia - 78 (38.42%) - group III.

1 group
Propofol - potentiator of GABA A receptors, Fentanyl - opioid (narcotic analgesic), Sevoflurane - inhalation drug, Morphine - opioid (narcotic analgesic), Promedol - opioid (narcotic analgesic).

2 groups
Propofol - potentiator of GABA A receptors, Fentanyl - opioid (narcotic analgesic), Sevoflurane - inhalation drug,

Dexmedotomidine is a selective agonist of alpha 2 receptors, Locoregional analgesia (lidocaine, naropin, bupivacaine - sodium channel blockers).

3 groups

Propofol - potentiator of GABA A receptors, Sevoflurane - inhalation drug, Dexmedotomidine is a selective agonist of alpha 2 receptors, Locoregional analgesia (lidocaine, naropin, bupivacaine - sodium channel blockers),

Dosing was done according to the individual characteristics of the patient.

Statistical Analysis: categorical variables are expressed as frequencies and % variables were compared with the use of the Fisher's Exact Test. Correlation analysis between categorical variables was performed by Spearman correlation analyses, p value <0.05 was considered as statistically significant. All statistical analyses were performed using SPSS version 23.

Results

The localization of pain after surgery is given in Table 1

Table 1. Distribution of pain according to localization and type of anesthesia

Phases of postoperative care	localization of pain	Group I (With opioids) n=49		Group II (With partial use of multimodal opioids) n=76		Group III (multimodal) n=78		F	p
		n	%	n	%	n	%		
Phase I	in the operated area	47	95.92	43	56.58	14	17.95	58.12	<0.0001
	head	19	38.78	9	11.84	1	1.28	20.94	<0.0001
	throat	10	20.41	4	5.26	0	0.00	10.94	<0.0001
	waist	20	40.82	14	18.42	4	5.13	14.17	<0.0001
	muscles	25	51.02	15	19.74	2	2.56	26.98	<0.0001
Phase II	Pain in the lower back	9	18.37	3	3.95	0	0.00	10.38	0.0001
	Pain in the muscles	11	22.45	8	10.53	0	0.00	9.77	0.0001

Post-anesthetic pain after intervention in Phase I of post-anesthetic care was distributed as follows:

As we can see, pain in the operated area is the most common, while throat pain is the rarest.

During anesthesia with opioids, compared to the second and third groups, the pain in the operative area, and the head, throat, waist and ears is significantly higher.

During multimodal anesthesia, pain is reliably less in all cases, and pain in the throat was not noted.

Correlations between the type of anesthesia and pain during surgery are shown in table 2.

Correlation analysis showed that opioid anesthesia was significantly correlated with postoperative pain, whereas multimodal anesthesia was significantly negatively correlated with all types of postoperative pain.

Table 2. Correlations between type of anesthesia and postoperative pain:

Factors		Anesthesia with opioids	With partial use of multimodal+opioids	Multimodal anesthesia
Pain in the operated area	r	0.504**	0.083	-0.526**
	p	<0.001	0.240	<0.001
Head pain	r	0.395**	-0.054	-0.294**
	p	<0.001	0.444	<0.001
Throat pain	r	0.301**	-0.050	-0.215**
	p	<0.001	0.480	0.002
Waist pain	r	0.320**	-0.006	-0.275**
	p	<0.001	0.933	<0.001
Muscles pain	r	0.422**	-0.018	-0.353**
	p	<0.001	0.797	<0.001
* - p<0.05,** - p<0.01				

In the second phase, in the opioid anesthesia group, compared to the second group, there is significantly more pain in the lower back and muscles, and in the third group, there was no pain at all.
The distribution of patients according to the intensity of pain in phase II is given in diagram 1.

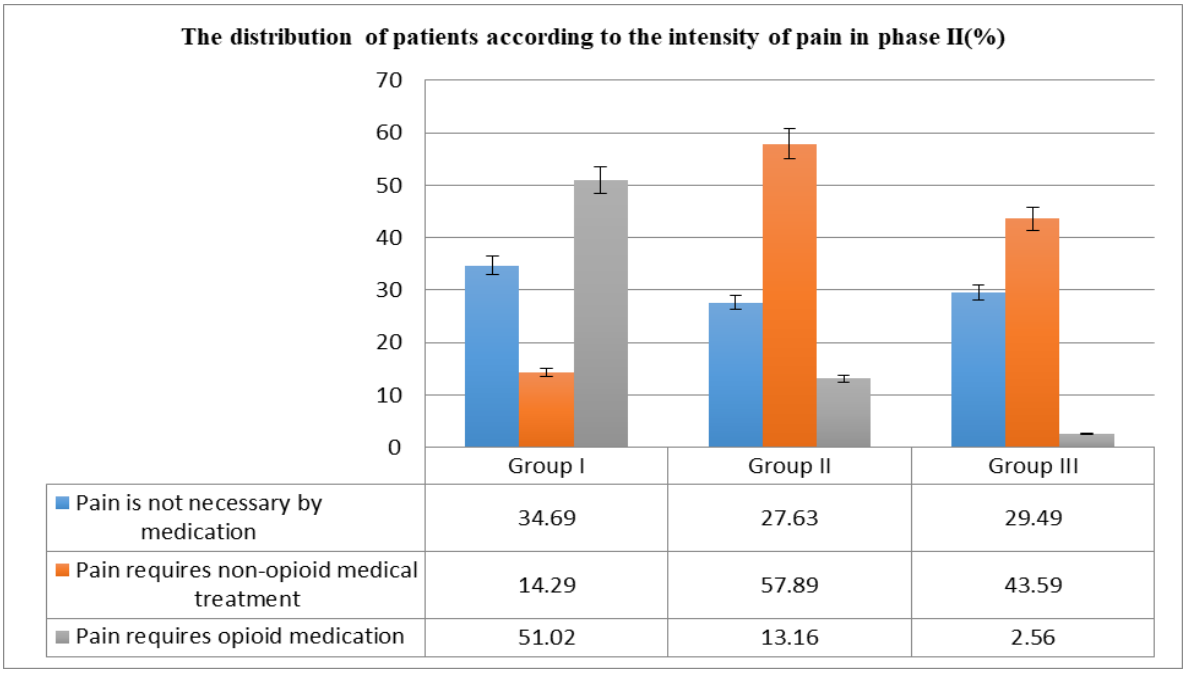

Diagram 1

No significant difference between the groups was observed in the frequency of patients who did not require medication for pain relief after surgery, the need for non-opioids was significantly higher in group II, and the need for opioids was significantly higher in group III.
The degree of pain in intra-hospital and post-hospital stages is given in Table 3.

Table 3. Assessment of pain quality at intrahospital and posthospital stages

Post intensive stages	degree of pain	Group I (With opioids) n=49		Group II (With partial use of multimodal opioids) n=76		Group III (multimodal) n=78		F	P
		n	%	n	%	n	%		
Intrahospital stage	Pain (discomfort) is not necessary by medication	1	2.04	4	5.26	4	5.13	30.51	<0.0001
	Pain requires non-opioid medical treatment	28	57.14	25	32.89	2	2.56	20.78	<0.0001
	Pain requires opioid medication	20	40.82	19	25.00	0	0.00	30.51	<0.0001
Ambulatory stage	Pain (discomfort) does not require medical treatment	7	14.29	5	6.58	3	3.85	2.48	0.0865
	Pain requires non-opioid medical treatment	18	36.73	9	11.84	0	0.00	21.15	<0.0001

As can be seen from the table, the frequency of patients who did not require medical treatment during the intrahospital stage is not significantly different from each other, and the pain requiring non-opioid treatment is significantly less after multimodal anesthesia. No patient in this group required opioid treatment.
In the ambulatory stage, no patient in the multimodal anesthesia group needed medical treatment, and significantly fewer patients in group II needed non-opioid treatment.

Discussion

Multimodal anesthesia (MMA) refers to the use of additive or synergistic combinations of analgesics to achieve clinically necessary analgesia, with the goal of minimizing the significant side effects associated with higher doses of a single aquagenic medication, such as opioid analgesics [8], especially since a patient's first exposure to opioids often occurs in the perioperative setting, a vulnerable time when multimodal therapy can play a major role in reducing opioid exposure[9].
The importance of multimodal anesthesia is particularly emphasized in patients who may be prone to opioid-related side effects, such as patients with obstructive sleep apnea. Healthcare systems can also benefit from implementing effective MMA, as fewer opioid-related side effects can improve patient outcomes, lead to faster recovery, and rational use of resources [10].
Our study showed that there is a reduction in postoperative pain under multimodal anesthesia. Opioid-free anesthesia allows us to avoid their use in the perioperative period. According to our

study, the frequency of the need for postoperative use of opioids is dramatically reduced in the multimodal anesthesia group.
Prevention of postoperative pain should begin immediately after planning the operative treatment. Based on the conclusion made after assessing the patient's condition and risk factors, a multidisciplinary group of doctors will draw up a perioperative plan for pain relief [12].

Conclusion
Multimodal anesthesia reduces perioperative pain and the need for perioperative opioid use.

REFERENCE

1. Sundbom M, Hedberg J, Marsk R, Boman L, Bylund A, Hedenbro J, Laurenius A, Lundegårdh G, Möller P, Olbers T, Ottosson J. Substantial decrease in comorbidity 5 years after gastric bypass: a population-based study from the Scandinavian Obesity Surgery Registry. Annals of surgery. 2017 Jun 1;265(6):1166-71.
2. Khera T, Rangasamy V. Cognition and pain: a review. Frontiers in psychology. 2021 May 21;12:673962.
3. Yam MF, Loh YC, Tan CS, Khadijah Adam S, Abdul Manan N, Basir R. General pathways of pain sensation and the major neurotransmitters involved in pain regulation. International journal of molecular sciences. 2018 Jul 24;19(8):2164.
4. Brown EN, Pavone KJ, Naranjo M. Multimodal general anesthesia: theory and practice. Anesthesia & Analgesia. 2018 Nov 1;127(5):1246-58.
5. Ovechkin AM, Sokologorskiy SV, Politov ME. Bezopioidnaya anesteziya i anal'geziya-dan' mode ili veleniye vremeni? Novosti khirurgii. 2019;27(6):700-15.
6. Gomon NL, Shlapak IP. Mul'timodal'naya kombinirovannaya anesteziya/anal'geziya v komplekse lecheniya khirurgicheskikh patsiyentov abdominal'nogo profilya. Novostikhirurgii. 2014;22(6):721-6.
7. Brown EN, Pavone KJ, Naranjo M. Multimodal general anesthesia: theory and practice. Anesthesia&Analgesia. 2018 Nov 1;127(5):1246-58.
8. Bhatia A, Buvanendran A. Anesthesia and postoperative pain control—multimodal anesthesia protocol. Journal of Spine Surgery. 2019 Sep;5(Suppl 2):S160.
9. Ramirez MF, Kamdar BB, Cata JP. Optimizing perioperative use of opioids: a multimodal approach. Current Anesthesiology Reports. 2020 Dec;10(4):404-15.
10. Stenberg E, dos Reis Falcao LF, O'Kane M, Liem R, Pournaras DJ, Salminen P, Urman RD, Wadhwa A, Gustafsson UO, Thorell A. Guidelines for perioperative care in bariatric surgery: Enhanced Recovery After Surgery (ERAS) Society recommendations: a 2021 update. World journal of surgery. 2022 Jan 4:1-23.
11. Sultana A, Torres D, Schumann R. Special indications for opioid free anaesthesia and analgesia, patient and procedure related: including obesity, sleep apnoea, chronic obstructive pulmonary disease, complex regional pain syndromes, opioid addiction and cancer surgery. Best Practice & Research Clinical Anaesthesiology. 2017 Dec 1;31(4):547-60.
12. Arabidze K, Gogokhia I, Lebanidze N. Postoperative pain management using multimodal analgesia. Scientific journal „Spectri ". 2022 Jun 15;1: 79-96.

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ONE CASE OF PULMONARY ABSCESS DUE TO EXTENSIVELY DRUG-RESISTANT (XDR) INFECTION

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ABSTRACT

Introduction

Infections due to multidrug resistance of the infected organism have become more common in clinical settings. The non-fermenter, gram-negative bacilli cause severe hospital infections. The main non-fermenter, gram-negative bacilli (BNF) microorganisms, that cause disease in humans are Pseudomonas aeruginosa, Acineto-bacter-baumannii, Burkholderia cepacia, Stenotro-phomonas., Alcaligenes, Moraxella, The family of enzymes carbapenemase – KPC, NDM-1, IMP, VIM, OXA-48 – is one of the most significant health challenges. For microorganisms : Klebsiella pneumoniae, Acinetobacter baumanni , and Pseudomonas aeruginosa was launched the terms : extensively drug-resistant (XDR) and pan drug-resistant (PDR) Gram-negative microorganisms. New antibiotic target some of the current most problematic Gram-negative pathogens, namely Klebsiella pneumoniae carbapenemase (KPC)- producing Enterobacteriaceae and multi-drug-resistant (MDR) *P. a* eruginosa. We presented a case, when sputum microbiological analysis in a patient with bilateral pneumonia and respiratory distress syndrome, revealed extensively drug-resistant (XDR) gram-negative microorganism. Also chest computer tomography diagnosed lung cavitation, for antibacterial treatment was used a new class of antibiotics, named Ceftazidime-Avibactam,a novel non-β-lactam, β-lactamase inhibitor(restores the activity of ceftazidime against the majority of β- lactamases ,ESBLs and carbapenemases, including KPCs– Ambler Class A, AmpC —Class C and oxacillinase OXA-48—Class D). The patient's state was improved and discharged with suitable recommendations.

Conclusion

In the therapy of XDR Gram-negative bacteria, colistin was considered a companion drug with novel agents es ceftazidime/avibactam for the treatment of carbapenem-resistant Enterobacteriaceae, also Fosfomycin as part of a combination treatment for CRE and XDR Pseudomonas aeruginosa infections.

Keywords: XDR infection, Multidrug-resistant, Cavitation

Introduction

Infections due to multidrug resistance of the infected organism have become more common in clinical settings. The general/species are Escherichia, Proteus, Enterobacter, Klebsiella, Citrobacter, Yersinia, and Shigella. The non-fermenter, gram-negative bacilli cause severe hospital infections. In ICU patients who undergo invasive procedures also cause opportunistic diseases. The main microorganisms are Pseudomonas aeruginosa, Acinetobacter baumannii, Stenotrophomonas, Alcaligenes, and Moraxella. Three main enzymes that inactivate antibiotics: β-lactamases, aminoglycoside-modifying enzymes, and chloramphenicol acetyltransferases (AACs). Bacteria that produce extended-spectrum β-lactamases, so called ESBL-producing bacteria , are resistant to penicillins, third-generation cephalosporins. Metallo-β-

lactamases classes of enzymes are resistant to inactivation by clavulanate, sulbactam, aztreonam, and carbapenems. Cephalosporinases are produced by all Gram-negative bacteria with exception of Salmonella and Klebsiella. This class of enzymes is resistant to all β-lactams except carbapenems. The family of enzymes carbapenemase – KPC, NDM-1, IMP, VIM, OXA-48 – is one of the most significant health challenges. For microorganisms: Klebsiella pneumonia, Acinetobacter baumanni and Pseudomonas aeruginosa was launched with the terms: extensively drug-resistant (XDR) and pan drug-resistant (PDR) Gram-negative microorganisms.

Two large groups, Enterobacteriaceae and the non-fermenters, are responsible for most clinical isolates; nevertheless, other clinically concerning gram-negative organisms exist, including Neisseria, Haemophilus spp., Helicobacter pylori, and Chlamydia trachomatis

The non-fermenter, gram-negative bacilli (BNF) have a lower frequency of isolation when compared to Enterobacteriaceae*;* however, they cause severe, fatal infections, especially in the hospital environment. They also cause opportunistic diseases in ICU patients who undergo invasive procedures. The main BNF microorganisms that cause disease in humans are Pseudomonas aeruginosa, Acinetobacter baumannii, Burkholderia cepacia, Stenotrophomonas, Alcaligenes, Moraxella.

Acinetobacter baumannii naturally produces AmpC cephalosporins and also oxacillinase (OXA), leaving it spontaneously immune to many drugs. Colistin, one of the few antibiotics that still treat multiresistant infections, already has a mobile resistance gene, mcr-1, and Enterobacteriaceae has a crucial role in the spread of this gene. New antibiotics is targeting some of the current most problematic Gram-negative pathogens, namely Klebsiella pneumoniae carbapenemase (KPC)-producing Enterobacteriaceae and multi-drug-resistant (MDR) *P*. aeruginosa.

70 year old man, Caucasus, was admitted to the hospital with respiratory failure, with an aggravated state despite treatment with antibiotics: ceftriaxone and azithromycin.

Chest X-ray and blood gas analysis confirmed diagnoses: bilateral pneumonia and adult respiratory distress syndrome. Sputum microbilogical analysis within admission revealed staphylococcus haemolyticus.

Staphylococcus haemolyticus	MB19(F-SOP_028B-001-03)
Oxacillin,cefoxitin., ampicillin/sulbactam, Amoxicillin/sulbactam, pipearacillin/tazobactam,cefuroxime,ceftazidime, ceftriaxone,cefepime, meropenem,erythromycin,clindamycin,cipriflixacxin, moxifloxacin, evofloxacin, ofloxacin,	R
Teicoplanin,vancomycin,fosfomycin	S

The patient started mechanical ventilation and was changed to antibacterial treatment with piperacillin / tazobactam, moxifloxacin and vancomycin. After 4 day treatment sputum culture revealed new microbes: Acinetobacter baumannii and Klebsiella pneumonia.

Acinetobacter baumani complex 10^6/ml	AG3MB.19(F-SOP-028B-001-03
Ticarcilin,ticarcilin/clavulatic acid,piperacillin/tazobactam.Ceftazidime, cefepime, Aztreonam ,Imipenem,Meropenem, Amikacin, Gentamicin, Tobramicin, Ciprofloxacin,Pefloxacin, Levofloxacin,ofloxacin, Cefoperazone .Sulbactam	R

Minocycline,Colistin	S
Rifampicin	I

Klebsiella pneumonia 10^6/ml	MB19(F-SOP_028B-001-03)
Ticarcilin,tTicarcilin/clavulatic acid, Piperacillin/tazobactam.Ceftazidime, Cefepime, Gentamicin, Ciprofloxacin, Levofloxacin, Ofloxacin, , Imipenem,Meropenem	R
Colistin	S

The antibacterial treatment regimen was changed with meropenem, and colomycin. Chest computer tomography revealed bilateral diffuse infiltrates in the lung parenchyma, alveolitis in the upper part of the lung, cavitation with the horizontal level of air and liquid, size -1.3cm x 4.6cm, in the upper, lateral part of right lung, near II riber. GeneXpert MTB diagnostic test for identification of Mycobacterium tuberculosis in bronchoalveolar liquid by PCR method was negative.

Next microbiological analysis of sputem revealed MDR klebsiella pneumonia with intermadiate sensitivity on colomycin. Antibacterial treatment was continued with colistin - zavicefta (ceftazidime /avibactam) combination. Zavicefta dose was 2/0,5 mg. every 8 h.

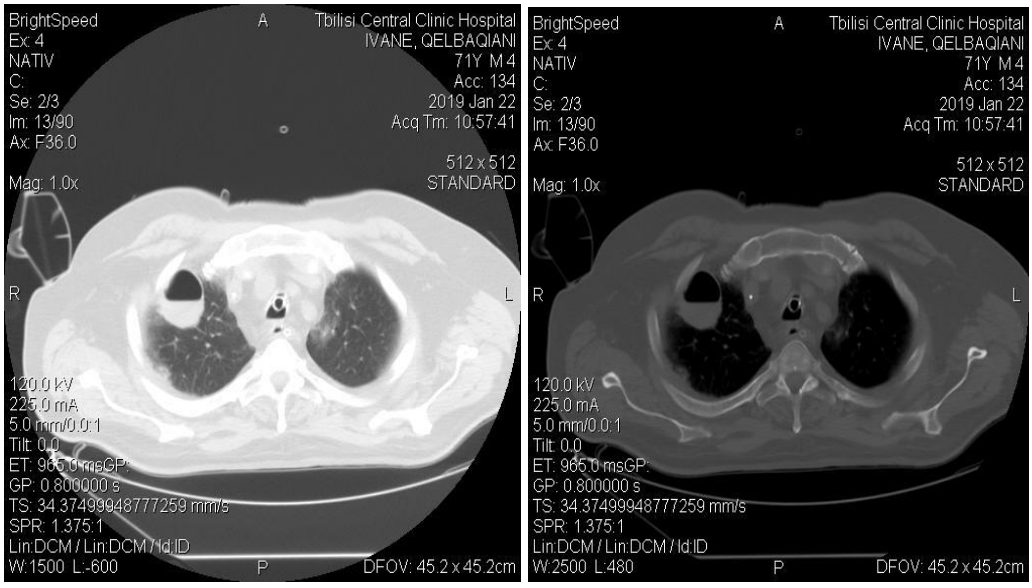

Figure 1
GeneXpert MTB diagnostic test for identification of Mycobacterium tuberculosis (MTB) in bronchoalveolar liquid by PCR method was negative.

Next microbiological analysis of sputem revealed MDR Acinetobacter baumani with intermadiate sensitivity on colomycin. Antibacterial treatment was continued with colistin and zavicefta (ceftazidime /avibactam). Zavicefta dose was 2/0,5 mg. every 8 hours.

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After one week of treatment chest computer tomography revealed increased intensity of bilateral diffuse infiltrates in the parenchyma in the lower part of the lung. In the upper, lateral part of right lung, near II riber, increased size of cavitation 4.3X 4.6cm, with the horizontal level of air and liquid.

Antibacterial treatment was defined as follows: zavicefta, colomycin, vancomycin, in next period was continued with zavicefta, fosfomycin and in last decade with zavicefta, clindamycin (1.8g/per day).

Ct scan shows a decrease in the size of cavitation and intensity of infiltration. The patient was discharged with suitable recommendations.

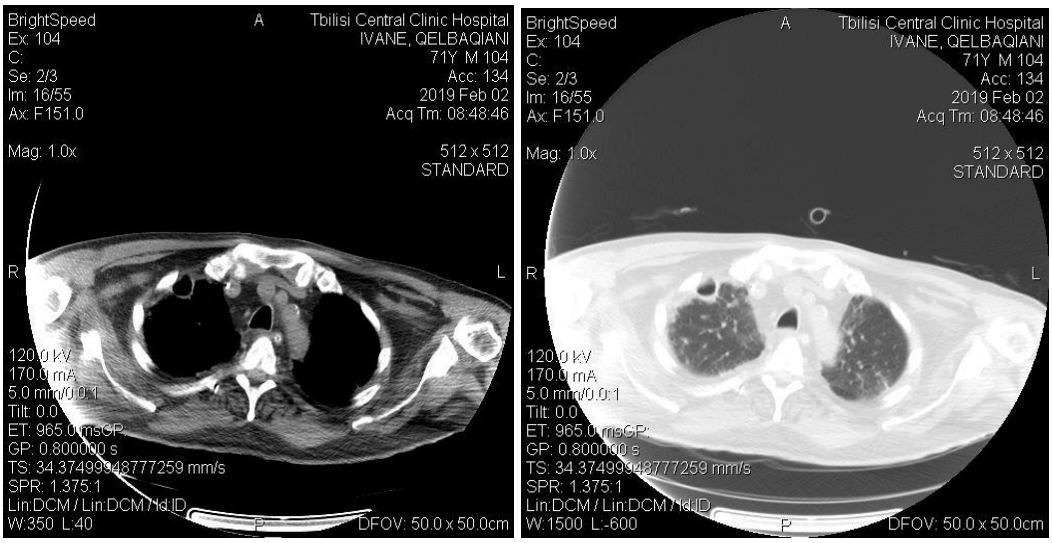

Figure 2

Sputum and blood microbiological analysis does not revealed any microb, antibacterial treatment continued with Zavicefta 7.5mg and fosfomycin 18 within one weak, and zavicefta –clindamicin combination within 2 weak. The patient's state improved, and was disconnected from mechanical ventilation .

On Ct scan revealed the decreased intensity of bilateral infiltrates in lower part of lung, bilateral diffuse sclerosis , decreased size of cavitation to 1.7X1.8cm with air level. (pict.3)

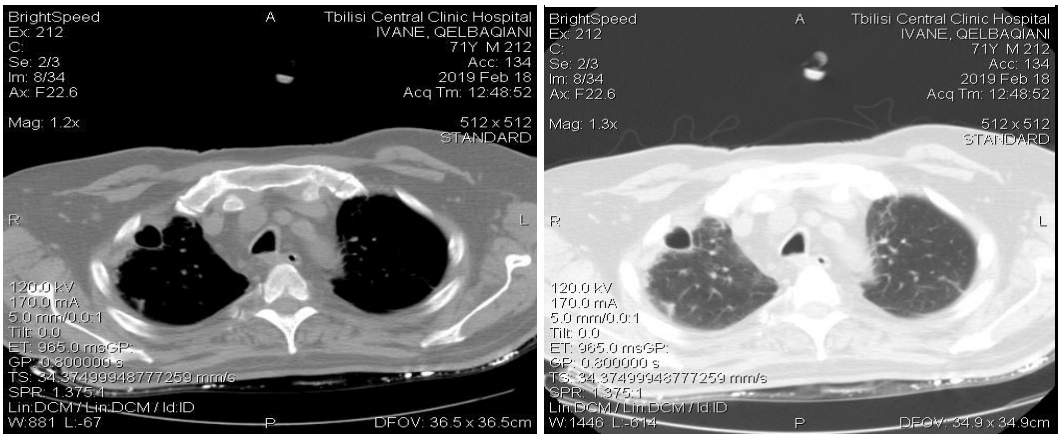

Figure 3

Discution

There are three main enzymes that inactivate antibiotics such as: β-lactamases, aminoglycoside-modifying enzymes, and chloramphenicol acetyltransferases (AACs). Bacteria that produce extended-spectrum β-lactamases, so-called ESBL-producing bacteria , are resistant to penicillins, third-generation cephalosporins. Metallo-β-lactamases classes of enzymes are resistant to inactivation by clavulanate, sulbactam, aztreonam, and carbapenems. Cephalosporinases are produced by all Gram-negative bacteria with exception of Salmonella and Klebsiella. This class of enzymes is resistant to all β-lactams except carbapenems. The family of enzymes carbapenemase – KPC, NDM-1, IMP, VIM, OXA-48 – is one of the most significant health challenges. For microorganisms: Klebsiella pneumoniae, Acinetobacter baumanni, and Pseudomonas aeruginosa was launched the terms : extensively drug-resistant (XDR) and pan drug-resistant (PDR) Gram-negative microorganisms.The non-fermenter, gram-negative bacilli (BNF) have a lower frequency of isolation when compared to Enterobacteriaceae; however, they cause severe, fatal infections, especially in the hospital environment. They also cause opportunistic diseases in ICU patients who undergo invasive procedures. The main BNF microorganisms that cause disease in humans are Pseudomonas aeruginosa, Acinetobacter baumannii, Burkholderiacepacia, Stenotrophomona, Alcaligenes, Moraxella. Enterobacteriaceae are a heterogeneous group, account for about 80% of gram-negative isolates. The general species that frequently affect humans are Escherichia, Proteus, Enterobacter, Klebsiella, Citrobacter, Yersinia, Shigella, and Salmonella among others. Avibactam, a novel non-β-lactam, β-lactamase inhibitor, restores the activity of ceftazidime against the majority of β- lactamases (ESBLs and carbapenemases, including KPCs– Ambler Class A, AmpC —Class C and oxacillinase OXA-48—Class D). Avibactam is not able to inhibit strains producing metallo-β-lactamases (MBL—Class B)

Conclusion

In the therapy of XDR Gram-negative bacteria , colistin was continued to be considered as a companion drug with novel agents es ceftazidim/avibactam ,also fosfomycin as part of combination treatment for CRE carbapenem-resistant enterobacteriaceae and XDR Pseudomonas aeruginosa infection.

REFERENCE

1. Ho J, Tambyah PA, Paterson DL. 2010. Multiresistant Gram-negative infections: a global perspective. Curr Opin Infect Dis 23:546–553.
2. World Health Organization. 2014. Antimicrobial resistance: global report on surveillance. World Health Organization, Geneva, Switzerland
3. Laxminarayan R, Sridhar D, Blaser M, Wang M, Woolhouse M. 2016. Achieving global targets for antimicrobial resistance. Science 353: 874–875.
4. Breidenstein EBM, de la Fuente-Nunez C, Hancock REW. 2011. Pseudomonas aeruginosa: all roads lead to resistance. Trends Microbiol 19:419–426.
5. Davis SD, Iannetta A, Wedgwood RJ. 1971. Activity of colistin against Pseudomonas aeruginosa: inhibition by calcium. J Infect Dis 124: 610–612.

6. Farha MA, Verschoor CP, Bowdish D, Brown ED. 2013. Collapsing the proton motive force to identify synergistic combinations against Staphylococcus aureus. Chem Biol 20:1168–1178.
7. Tumbarello M, Trecarichi EM, De Rosa FG, Giannella M, Giacobbe DR, Bassetti M, et al. Infections caused by KPC-producing Klebsiella pneumoniae:differences in therapy and mortality in a multicentre study. J Antimicrob Chemother. (2015) 70:2133–43.
8. Dinh A, Saliomon J, Bru JP, Bernard L. Fosfomycin: efficacy against infections caused by multidrug-resistant bacteria. Scand J Infect Dis. (2012) 44:182–9.
9. Munoz-Price LS, Poirel L, Bonomo RA, Schwaber MJ, Daikos GL, Cormican M, et al. . Clinical epidemiology of the global expansion of Klebsiella pneumoniae carbapenemases. Lancet Infect Dis. (2013) 13:785–96.
10. Giamarellou H, Poulakou G. Multidrug-resistant Gram-negative infections: what are the treatment options? Drugs. (2009) 69:1879–901.
11. Kalil AC, Metersky ML, Klompas M, Muscedere J, Sweeney DA, Palmer LB, et al. Management of adults with hospital-acquired and ventilator-associated pneumonia: 2016 clinical practice guidelines by the infectious diseases society of america and the american thoracic society. Clin Infect Dis. (2016) 63:575–82.
12. Souli M, Galani I, Boukovalas S, Gourgoulis MG, Chryssouli Z, Kanellakopoulou K, et al. . In vitro interactions of antimicrobial combinations with fosfomycin against KPC-2-producing Klebsiella pneumoniae and protection of resistance development. Antimicrob Agents Chemother. (2011) 55:2395–7.
13. Samonis G, Maraki S, Karageorgopoulos DE, Vouloumanou EK, Falagas ME. Synergy of fosfomycin with carbapenems, colistin, netilmicin, and tigecycline against multidrug-resistant Klebsiella pneumoniae, Escherichia coli, and Pseudomonas aeruginosa clinical isolates. Eur J Clin Microbiol Infect Dis. (2012) 31:695–701.
14. Betts JW, Phee LM, Hornsey M, Woodford M, Wareham DW. In vitro and in vivo activities of tigecycline-colistin combination therapies against carbapenem-resistant Enterobacteriaceae. Antimicrob Agents Chemother. (2014) 58:3541–6.
15. Almaghrabi R, Clancy CJ, Doi Y, Hao B, Chen L, Shields RK, et al. . Carbapenem-resistant Klebsiella pneumoniae strains exhibit diversity in aminoglycosidemodifying enzymes, which exert differing effects on plazomicin and other agents. Antimicrob Agents Chemother. (2014) 58:4443–51.
16. Satlin MJ, Kubin CJ, Blumenthal JS, Cohen AB, Furuya EY, Wilson SJ, et al. . Comparative effectiveness of aminoglycosides, polymyxin B, and tigecycline for clearance of carbapenem resistant Klebsiella pneumoniae from urine. Antimicrob Agents Chemother. (2011) 55:5893–9.
17. AstraZeneca Summary of Product Characteristics: European Medicines Agency SPC for ceftazidime avibactam (Zavicefta™),. (2016). Available online at: https://www.medicines.org.uk/emc/medicine/33061 (accessed January 10, 2019).
18. Vabomere® (meropenem/vaborbactam for injection) [prescribing information] FDA. (2017). Available online at: www.accessdata.fda.gov/ drugsatfda_docs/label/2017/209776lbl.pdf (accessed March 10, 2019).
19. Natesan S, Pai MP, Lodise TP. Determination of alternative ceftolozane/tazobactam dosing regimens for patients with infections due to Pseudomonas aeruginosa with MIC values between 4 and 32 mg/L. J Antimicrob Chemother. (2017) 72:2813–6.

20. Compain F, Arthur M. Impaired inhibition by avibactam and resistance to the ceftazidime-avibactam combination due to the D179Y substitution in the KPC-2 β-lactamase. Antimicrob Agents Chemother. (2017) 61:e00451–17.
21. Shields RK, Nguyen MH, Press EG, Chen L, Kreiswirth BN, Clancy CJ. In vitro selection of meropenem resistance among ceftazidime-avibactam-resistant, meropenem-susceptible Klebsiella pneumoniae isolates with variant KPC-3 carbapenemases. Antimicrob Agents Chemother. (2017) 61:e00079–17.
22. Levasseur P, Girard AM, Claudon M, Goossens H, Black MT, Coleman K, et al. . In vitro antibacterial activity of the ceftazidime-avibactam (NXL104) combination against Pseudomonas aeruginosa clinical isolates. Antimicrob Agents Chemother. (2012) 56:1606–8.
23. Flamm RK, Sader HS, Farrell DJ, Jones RN. Ceftazidime-avibactam and comparator agents tested against urinary tract isolates from a global surveillance program 2011. Diagn Microbiol Infect Dis. (2014) 80:233–8.
24. Shields RK, Nguyen MH, Chen L, Press EG, Kreiswirth BN, Clancy CJ. Pneumonia and renal replacement therapy are risk factors for ceftazidime-avibactam treatment failures and resistance among patients with carbapenem-resistant Enterobacteriaceae infections. Antimicrob Agents Chemother. (2018) 62:e02497–517.
25. Shields RK, Nguyen MH, Chen L, Press EG, Potoski BA, Marini RV, et al. . Ceftazidime-avibactam is superior to other treatment regimens against carbapenem-resistant Klebsiella pneumoniae bacteremia. Antimicrob Agents Chemother. (2017) 61:e00883–917.
26. Tumbarello M, Trecarichi EM, Corona A, De Rosa FG, Bassetti M, Mussini C, et al. . Efficacy of ceftazidime-avibactam salvage therapy in patients with infections caused by Klebsiella pneumoniae carbapenemase-producing K. pneumoniae. Clin Infect Dis. (2019) 68:355–64.
27. Ilias Karaiskos,1 Styliani Lagou,2 Konstantinos Pontikis,3 Vasiliki Rapti,2 and Garyphallia Poulakou2,* The “Old” and the “New” Antibiotics for MDR Gram-Negative Pathogens: For Whom, When, and How. Front Public Health. 2019; 7: 151. Published online 2019 Jun 11.

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CASE OF MRSA BACTERIEMIA AND M/XDR GRAM-NEGATIVE INFECTION

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Bacteremia caused by Staphylococcus aureus is a serious infection associated with high morbidity and mortality and often results in infective endocarditis, and lung abscess, which negatively impact on patient outcomes. Highly virulent, antibiotic-resistant strains such as methicillin-resistant *S. aureus* (MRSA) are particularly challenging to treat. In *S. aureus*-induced pneumonia, the intense inflammatory response leads to severe lung injury and ARDS . We present a case to highlighting the need for prolonged treatment and close monitoring of patients espetially with scomplications associated with S. aureus bacteremia. The patient was transferred from the clinic, where he was admitted for paraplegia of the lower extremities, transverse myelitis was diagnosed. He underwent pulse therapy with methylpredizolone, due to the deterioration of his condition, he was transferred to the intensive care unit of our hospital .The patient underwent repeated examinations and was diagnosed with an epidural abscess at the level of the C5-Th1 vertebrae.

Figure 1. MRI of the cervical vertebrae. Sagittal section.

In the posterior epidural space at the level of C5-Th1 vertebrae, there is an area of viscous-fluid intensity (an epidural abscess is possible), which causes compression of the posterior cerebrospinal fluid space and the spinal cord in these segments, intervertebral discs are characterized with normal intensity signal (October 10, 2022)
T1 in. T2 weighted image. dT1-weighted image with contrast enhancement. In the left occiput, subcortical Irregular, oval-shaped small high-intensity anomalous focus (SE T1, FLAIR T2) and hypointense (FRFSE T2) with a calcified area. After the introduction of a contrast agent (Magnevist 0.5 mmol/ml, 20 ml IV), the MRI picture of the brain does not change, the inclusion

of contrast is not fixed. An MRI revealed an acute microhemorrhagic focus in the left and occipital part of the brain.

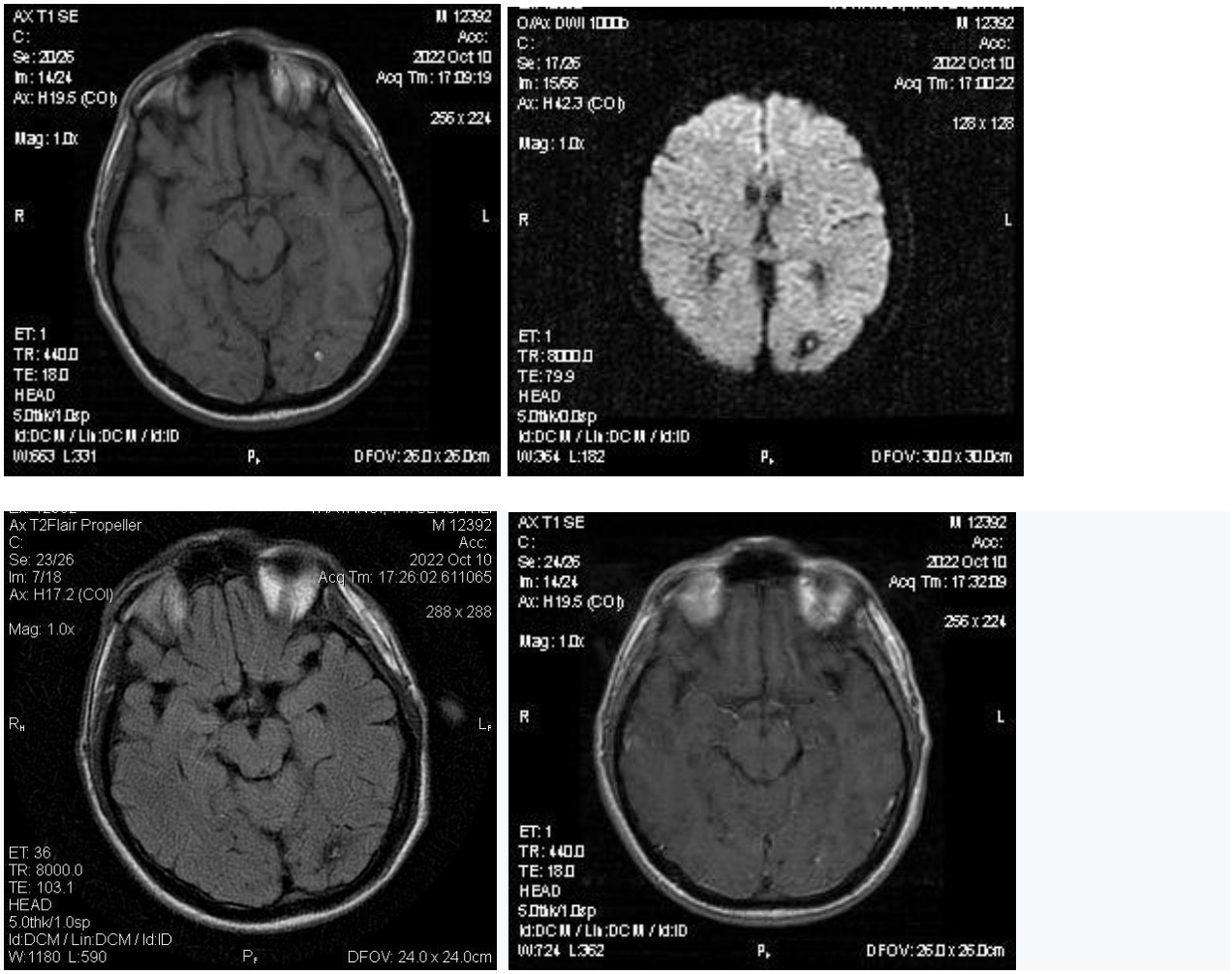

Figure 2. (10 .10 .22) MRI of the brain. Diffusion limited imaging.

Conducted surgical treatment - drainage of the epidural abscess. A bacteriological investigation of the sputum, blood and wound, revealed Staphylococcus aureus (MRSA). The presence of *S.* aureus in the bloodstream (bacteremia) was lead to the development of sepsis, *S.* aureus sepsis and later endocarditis. The patient is on mechanical ventilation, in coma state, with unstable hemodynamic and under pressors support, and fever. CSF results revealed meningitis , and treatment of staphylococcal infection in the blood continues, as well as antibacterial treatment of meningitis.

CSF analysis (Table 1) revealed high level of protein and cytosis

CSF 10.10 .22	
CMV IgM	neg
CMV IgG	7.6 iu/ml (pos> 0.5 arbU/ ml)

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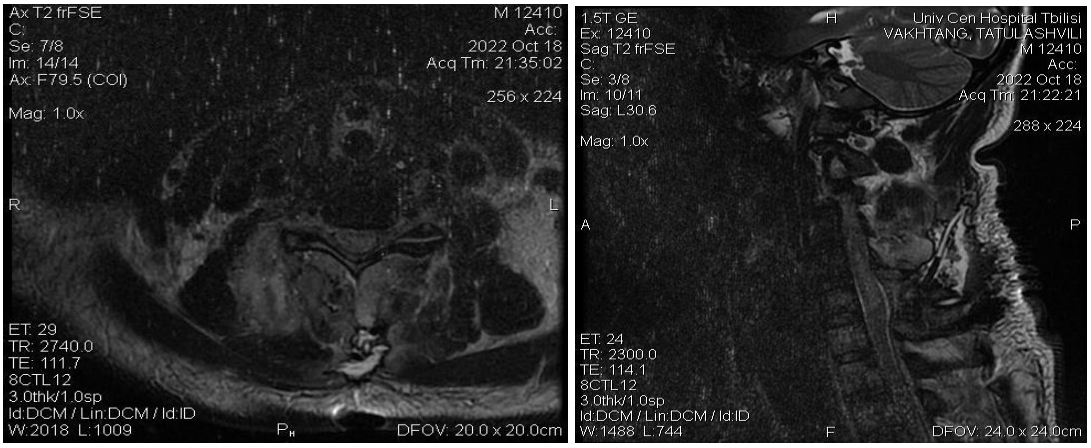
EBV—VCA IgM	neg
EBV-VCA IgG	96 arbU/ml (pos >5arbU/ml)
CSF (10.10 22)	
Protein	5930 mg/l
Leicocyte	0.512 X 10^3/mkl
Erithrocyte	0.001X10^6/mkl
TC-BF	0.512 X 10^3/mkl

Table 1



On the obtained MRI scans: compared to the previous study (October 10, 2020), viscous fluid is no longer fixed in the posterior epidural space at the level of C5-Th1 vertebrae. A postoperative bone (arcoflavotomy) defect was found in both C6-C7 arches. In the operated area - a drainage tube. Both right paravertebral soft tissues were damaged at the level of C4-C7 vertebrae (10/18/2022)

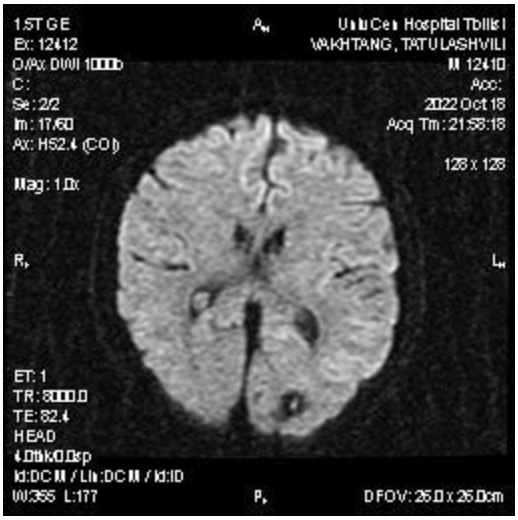


Figure 4. MRI of the brain

On MRI, the picture is not changed, no acute intracerebral process has been detected. (10/18/2022)
CSF analysis revealed changes (table2)

Table 2

CSF (18.10 .22)	
Protein	10773 mg/l
WbC _BF	0.045 X103/mkl (n <0.005)
TC-BF	0.045X103/mkl
glucose	3.89mmol/l
MN%	23%
PMN%	85%

On the axial section in the left occipital lobe, the contours are indistinct, a small hyperdense focus. midstructures are not displaced (09/10/2022)

Figure 5. CT scan of the brain.

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Figure 6. CT scans of the brain.

Sputum (17.10) bacteriological analysis revealed Staphylococcus aureus (MRSA). The patient's condition worsened due to the development of severe respiratory distress syndrome. In the lung parenchyma, extensive infiltration changes of the consolidation type with subtotal distribution are detected on both sides, against which there are also different localization foci of density, in the right lower lobe, against the background of consolidation, there are also areas of liquid density. There is free fluid in both pleural cavities, with stratification on the right at 3.4 cm, and on the left at 3.7 cm. Free air was not detected. (10/18/2022. Figure 7)

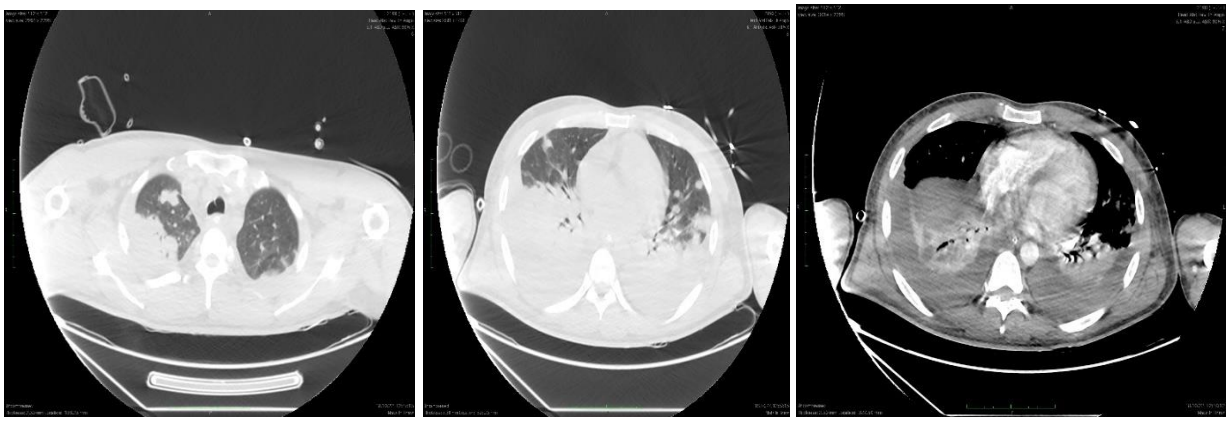

Figure 7. CT scan of the chest, with contrast enhancement

Focal infiltrative changes with central destruction are observed in the upper lobes of bilateral lungs. In the lower lobes there are extensive consolidated infiltrative changes, on the right in the background there are several areas of low density and a 4.5 cm cavity containing gas and liquid (horizontal liquid level). In the pleural cavity on both sides of the free fluid, bundle 5.2 cm on the right. 3.2 cm to the left (10/27/2022, Figure 8)

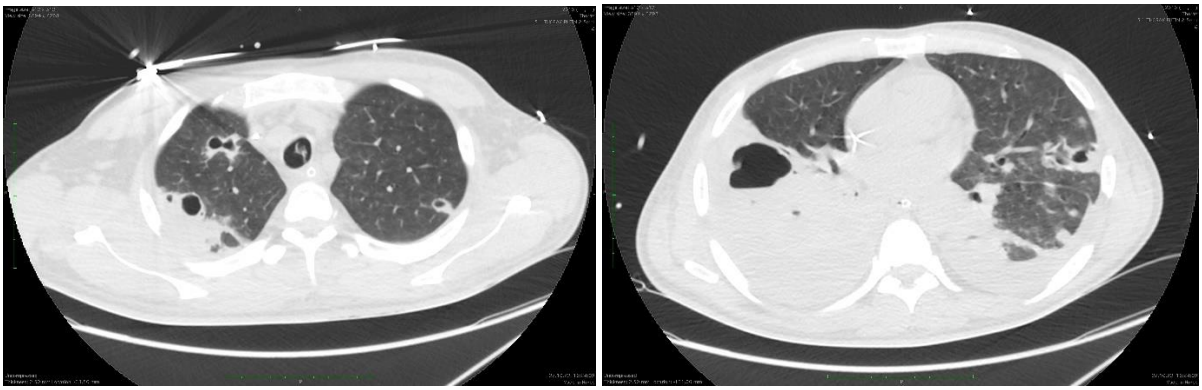

Figure 8. CT scan of the chest cavity.

In the left pleural cavity was detected free air. Focal infiltrative changes with central tissue damage are observed in the upper lobes of the lungs. In the lower lobes, consolidated infiltrative changes are expressed with several areas of reduced density, on the right cavitation containing air

and liquid, revealed a horizontal level of a liquid . There is free fluid in the pleural cavity on both sides, separation 3.7 cm on the right. 2.5cm –left (Figure 9)

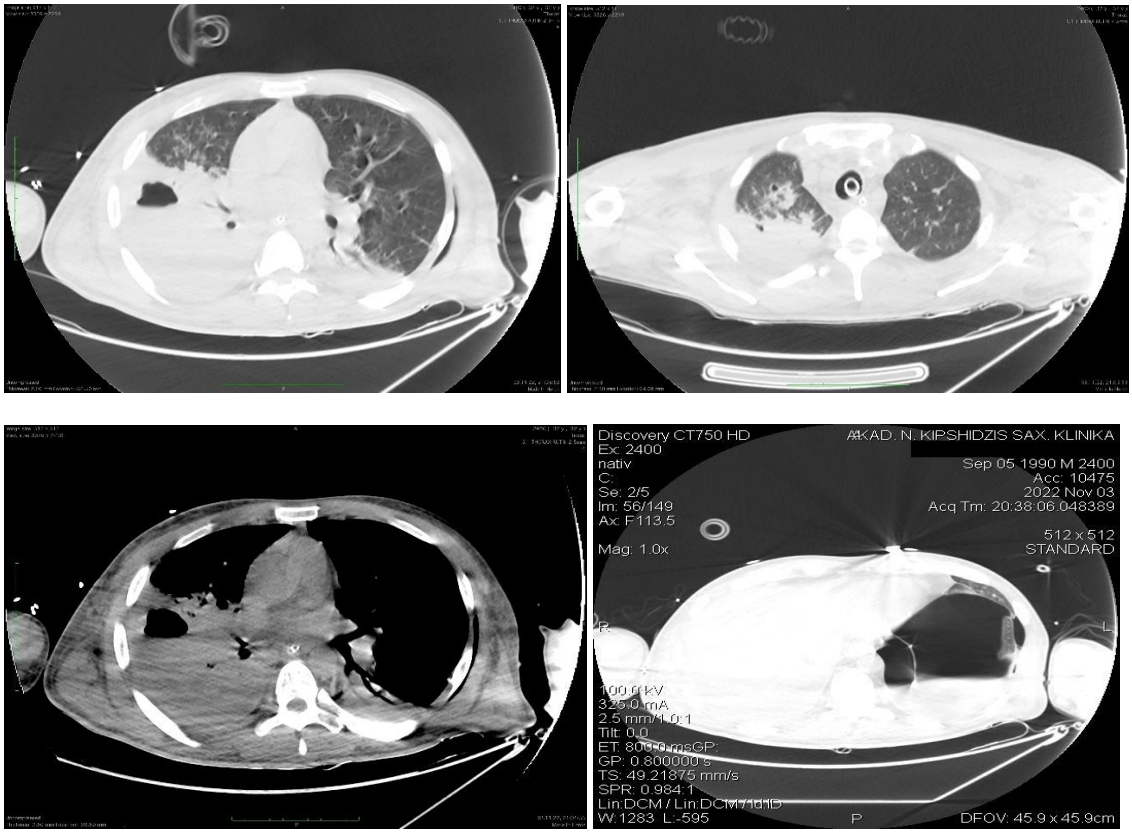

Figure 9. CT chest.

The pleural cavity of patient was drained. Patient is on mechanical ventilation $PaO_2/ FiO_2 < 100$ mm.Hg . CSF changes is presented in table 3.

CSF (22/10 .22)	
Protein	3098 mg/l (n 200-400 mg/l)
Glucose	2.17 mmol/l (2.22-3.89)
WBC -BF	0.041
RBc --BF	0.001 X10 ^{3}/mkl
TC--BF	0.041 X10^4/mkl
PMN %	24.4%
MN %	75.65

Table 3

Angiographic examination does not reveal filling defects in the pulmonary trunk and bilateral main, lobar and segmental arteries, there are no reliable signs of thrombosis. Focal infiltrative changes with central destruction are observed in the upper lobes of the lungs. Consolidated

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infiltrative changes are determined in the lower lobes, there is free fluid in the pleural cavity on both sides, with stratification on the right 2.5 cm. 0.5 cm to the left (11/11/2022—Figure 10).
The patient was performed a tracheostomy.

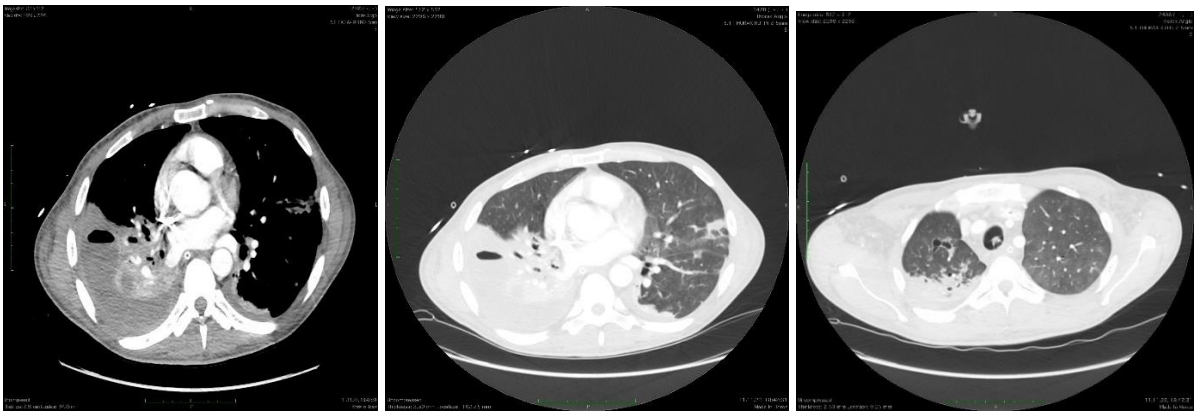

Figure 10. CT scan of the chest. with contrast enhancement.

A tracheostomy tube is visible in the trachea, In the lungs on both sides, there is a decrease in transparency, against the background of which there are areas of medium- and small-focal infiltration, in the lower lobe on the right there is an extensive consolidation against which there are cavities with an air and small volume of liquid. In the upper lobe there are cavities with air of central localization. On the left, there are consolidation at the level of the basal segments. (28/11/2022—Figure.11)

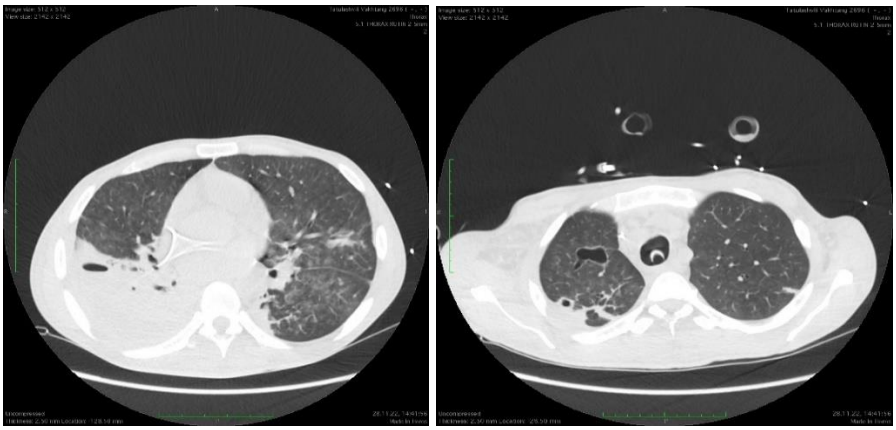

Figure 11. CT scan of the chest.

The decrease in transparency in bilateral lungs is less pronounced. The consolidation in the lower lobe on the right is somewhat reduced, the number of air cavities against the background of the consolidation is reduced, a subpleural air cavity is preserved at its upper edge. Air cavities in the upper lobe are no longer visible, fibrous stretch marks appear instead. There is a small fluid effusion in the bilateral pleural cavity, the maximum separation is 2.2 cm on the right and 1.5 cm on the left, no gas is detected in the bilateral pleural cavity.

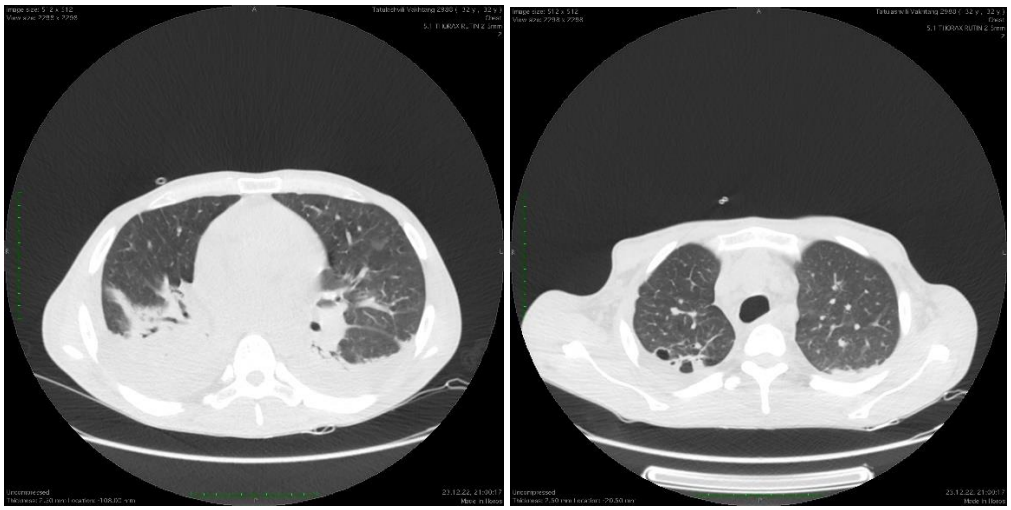

Figure 12. CT scan of the chest.

Different materials were examined during the course of the disease, and different groups of microbes and sensitivity to antibiotics were observed (Table 4).

Bacteriopgical analyses	Sputem /	Blood/	
09.10.22	St. aureus(MRSA)/ TEicoplanin, vancomycin , tigecycline, moxiflocxacin.	St. aureus(MRSA)/ Vancomycin, clindamycine, Teicoplanin.	St. aureus(MRSA)/ TEicoplanin,vancomycin, tigecycline, moxiflocxacin, erythromycin
17.10.22	St aureus / (TEicoplanin,vancomycin, tigecycline, moxiflocxacin) Candida spp		
24.11.22	Klebsiella pneumonia/ (zavicefta , gentamicin , tigecyclin)	St. aureus/MRSA	
27.11.22	Klebsiella pneumonia		
07.11.22	pseudomonas aeruginosa / (colistin -fosfomyscin)		
18.11.22	pseudomonas aeruginosa / (colistin -fosfomyscin)		
04.12.22	pseudomonas aeruginosa / (colisti n)		
19.12.22	Klebsiella pneumonia// pseudomonas aeruginosa / colistin,meropenem,tgecyclin		sterile
07.12.22.		negative	

Table 4

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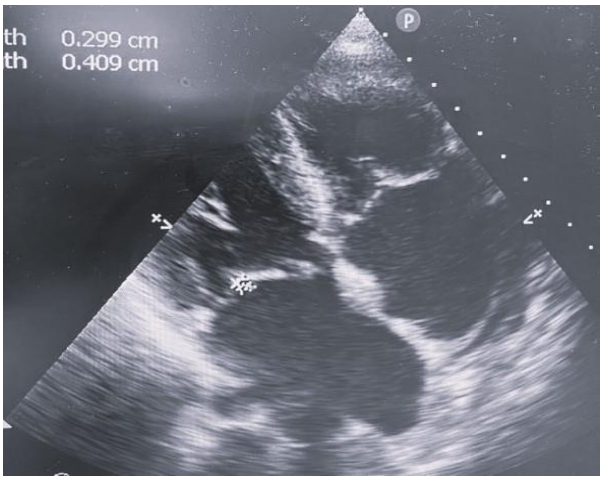
Heart valves were evaluated periodically. After one episode of fever, the presence of vegetation on the mitral valve leaflet was revealed.



CDI, Clostridium difficile infections presenting with fever, abdominal pain, and diarrhea for several days were complicated with toxic megacolon, unstable hemodynamic status and septic shock.

Clostridium defficile	CDH ,A toxin , B toxin
29.11	Negative
20.12	Positive

Table 5
The scheme of antibacterial treatment implied the impact primarily on the gram-positive flora. Changing the combination of antibiotics occurred as clinical, radiological, or laboratory parameters worsened.

09/10	10/10	13/x	19/x-20/x	23/x-08/XI	09//XI—24/XI	25/XI --06/XII	07/XII-19/XII	
Pip/tazo	meropenem	meronem	meronem	meronem	meropemen	Tigecyclin	Tigecyclin	Colomycin
vancomycin	vancomycin	aciklovir	aciklovir	aciclovir	vancomycin	Zavicefta	Vancomycin	Vancomycin
			vancomicin	Vancomicin	kolomycin	Colomycin	Colomycin	Tigecyclin
			Colistin	linezolid	fosfomycin	Vancomycin	Meronem	Meropenem
			Moxifloxacin	Moxifloxacin	Moxiflocacin	Meropenem	Metronidazol	
			fluconazol	meronem				
			meropene	Fluconazol				

In severely critically ill patients, empiric antibiotic treatment is usually a combination of antibiotics to increase the likelihood that the bacteria causing the infection will be reliably

suppressed and adequate antimicrobial therapy will not be delayed. As already mentioned, inadequate antibiotic therapy is associated with high mortality. Potential causative agents may be enterobacteria, producing ESBL, gram-negative rods resistant to carbapenems (Enterobacteria, Pseudomonas, Acineto bacteria).

Methicillin-resistant Staphylococcus aureus (MRSA), has also been found in blood, in sputum and in the wound. Tigecycline improved the treatment regimen for ESBL and carbapenem-resistant gram-negative rods, as well as for a number of multidrug-resistant gram-positive pathogens (MRSA, VRSA, VRE).

With the appointment of Zavicefta (ceftazidime/avibactam), the regimen was strengthened for ESBL, carbapenem-resistant gram-negative organisms, and to expand coverage of multidrug-resistant strains of Pseudomonas.

A systematic review and meta-analysis of three cohort or case–control studies evaluated patients and found a lower mortality rate with DCT (dual carbapenem therapy) when compared to the control treatment (colistin, tigecycline and aminoglycoside monotherapies, or combined regimens). Synergistic drug therapy combinations that include penicillin plus cephalosporins, have decreased microbial counts and improved clinical outcomes in infections caused by Gram-positive bacteria. Against multidrug-resistant Gram-negative microorganisms, the use of therapeutic regimens combining beta-lactam/beta-lactam inhibitors with carbapenems has resulted in the resolution of bacterial infections. Antimicrobial resistance associated increase in mortality. Beta-lactams have a safe profile and are bactericidal against most Gram-positive and Gram-negative microorganisms. It is used of dual beta-lactam therapy to overcome multidrug-resistant pathogens: long-course (>18 days) therapy has the obvious benefit of maximizing the chance of infection resolution .

Patient discharged from hospital, with spontaneous breathing, stable parameters,

Keywords: Epidural Abscess, ARDS, Endocarditis

REFERENCES

1. Kuehl R, Morata L, Boeing C, Subirana I, Seifert H, Rieg S, et al.. Defining persistent Staphylococcus aureus bacteraemia: secondary analysis of a prospective cohort study. Lancet Infect Dis. (2020) 20:1409–17.
2. Lesens O, Hansmann Y, Brannigan E, Remy V, Hopkins S, Martinot M, et al.. Positive surveillance blood culture is a predictive factor for secondary metastatic infection in patients with Staphylococcus aureus bacteraemia. J Infect. (2004) 48:245–52.
3. Miller JM, Binnicker MJ, Campbell S, Carroll KC, Chapin KC, Gilligan PH, et al.. A guide to utilization of the microbiology laboratory for diagnosis of infectious diseases: 2018 update by the Infectious Diseases Society of America and the American Society for Microbiology. Clin Infect Dis. (2018) 67:e1–94.
4. Seifert H, Abele-Horn M, Fätkenheuer G, Glück T, Jansen B, Kern WV, et al.. Blutkulturdiagnostik: Sepsis, Endokarditis, Katheterinfektionen, Teil II. München: Elsevier Urban & Fischer; (2007). p. 59 –126.
5. Meybohm P, Kleinerüschkamp A, Zacharowski K. Patient blood management. In: Rossaint R, Werner C, Zwißler B, editors. Die Anästhesiologie. Berlin, Heidelberg: Springer Berlin Heidelberg; (2019). p. 211–5.

6. Weis S, Kesselmeier M, Davis JS, Morris AM, Lee S, Scherag A, et al.. Cefazolin versus anti-staphylococcal penicillins for the treatment of patients with Staphylococcus aureus bacteraemia. Clin Microbiol Infect. (2019) 25:818–27.
7. Paul M, Zemer-Wassercug N, Talker O, Lishtzinsky Y, Lev B, Samra Z, et al.. Are all beta-lactams similarly effective in the treatment of methicillin-sensitive Staphylococcus aureus bacteraemia? Clin Microbiol Infect. (2011) 17:1581–6.
8. Castells M, Khan DA, Phillips EJ. Penicillin allergy. N Engl J Med. (2019) 381:2338–51.
9. Liu C, Bayer A, Cosgrove SE, Daum RS, Fridkin SK, Gorwitz RJ, et al.. Clinical practice guidelines by the Infectious Diseases Society of America for the treatment of methicillin-resistant Staphylococcus aureus infections in adults and children. Clin Infect Dis. (2011) 52:e18–55.
10. Kullar R, Davis SL, Levine DP, Rybak MJ. Impact of vancomycin exposure on outcomes in patients with methicillin-resistant Staphylococcus aureus bacteremia: support for consensus guidelines suggested targets. Clin Infect Dis. (2011) 52:975–81.
11. Forstner C, Dungl C, Tobudic S, Mitteregger D, Lagler H, Burgmann H. Predictors of clinical and microbiological treatment failure in patients with methicillin-resistant Staphylococcus aureus (MRSA) bacteraemia: a retrospective cohort study in a region with low MRSA prevalence. Clin Microbiol Infect. (2013) 19:E291–7.
12. Soriano A, Marco F, Martínez JA, Pisos E, Almela M, Dimova VP, et al.. Influence of vancomycin minimum inhibitory concentration on the treatment of methicillin-resistant Staphylococcus aureus bacteremia. Clin Infect Dis. (2008) 46:193–200.
13. Howden BP, Ward PB, Charles PG, Korman TM, Fuller A, Du Cros P, et al.. Treatment outcomes for serious infections caused by methicillin-resistant Staphylococcus aureus with reduced vancomycin susceptibility. Clin Infect Dis. (2004) 38:521–8.
14. Tenover FC, Moellering RC. The rationale for revising the Clinical and Laboratory Standards Institute vancomycin minimal inhibitory concentration interpretive criteria for Staphylococcus aureus. Clin Infect Dis. (2007) 44:1208–15.
15. Minejima E, Mai N, Bui N, Mert M, Mack WJ, She RC, et al.. Defining the breakpoint duration of Staphylococcus aureus bacteremia predictive of poor outcomes. Clin Infect Dis. (2020) 70:566–73.
16. Shariati A, Dadashi M, Moghadam MT, van Belkum A, Yaslianifard S, Darban-Sarokhalil D. Global prevalence and distribution of vancomycin resistant, vancomycin intermediate and heterogeneously vancomycin intermediate Staphylococcus aureus clinical isolates: a systematic review and meta-analysis. Sci Rep. (2020) 10:12689.
17. Moise PA, North D, Steenbergen JN, Sakoulas G. Susceptibility relationship between vancomycin and daptomycin in Staphylococcus aureus: facts and assumptions. Lancet Infect Dis. (2009) 9:617–24.
18. Prasad P, Sun J, Danner RL, Natanson C. Excess deaths associated with tigecycline after approval based on noninferiority trials. Clin Infect Dis. (2012) 54:1699–709.
19. White BP, Barber KE, Stover KR. Ceftaroline for the treatment of methicillin-resistant Staphylococcus aureus bacteremia. Am J Health Syst Pharm. (2017) 74:201–8.
20. Bryson-Cahn C, Beieler AM, Chan JD, Harrington RD, Dhanireddy S. Dalbavancin as secondary therapy for serious Staphylococcus aureus infections in a vulnerable patient population. Open Forum Infect Dis. (2019) 6:ofz028.

21. van Hise NW, Anderson M, McKinsey D, McKinsey J, Harting B, Belmares J, et al.. The use of dalbavancin for Staphylococcus aureus bacteremia in persons who inject drugs (PWID). Open Forum Infect Dis. (2019) 6:S772.
22. Iversen K, Ihlemann N, Gill SU, Madsen T, Elming H, Jensen KT, et al.. Partial oral versus intravenous antibiotic treatment of endocarditis. N Engl J Med. (2019) 380:415–24.
23. Kaasch AJ, Fätkenheuer G, Prinz-Langenohl R, Paulus U, Hellmich M, Weiß V, et al.. Early oral switch therapy in low-risk Staphylococcus aureus bloodstream infection (SABATO): study protocol for a randomized controlled trial. Trials. (2015) 16:450.
24. Bai AD, Showler A, Burry L, Steinberg M, Ricciuto DR, Fernandes T, et al.. Impact of infectious disease consultation on quality of care, mortality, and length of stay in Staphylococcus aureus bacteremia: results from a large multicenter cohort study. Clin Infect Dis. (2015) 60:1451–61.
25. Kaasch AJ, Fowler VG, Rieg S, Peyerl-Hoffmann G, Birkholz H, Hellmich M, et al.. Use of a simple criteria set for guiding echocardiography in nosocomial Staphylococcus aureus bacteremia. Clin Infect Dis. (2011) 53:1–9.
26. Tubiana S, Duval X, Alla F, Selton-Suty C, Tattevin P, Delahaye F, et al.. The VIRSTA score, a prediction score to estimate risk of infective endocarditis and determine priority for echocardiography in patients with Staphylococcus aureus bacteremia. J Infect. (2016) 72:544–53.
27. Salvador VB, Chapagain B, Joshi A, Brennessel DJ. Clinical risk factors for infective endocarditis in Staphylococcus aureus bacteremia. Tex Heart Inst J. (2017) 44:10–5.
28. Oever J ten, Jansen JL, van der Vaart TW, Schouten JA, Hulscher ME, Verbon A. Development of quality indicators for the management of Staphylococcus aureus bacteraemia. J Antimicrob Chemother. (2019) 74:3344–51.
29. Tong SY, Lee TC. Staphylococcus aureus bacteraemia: does duration matter? Lancet Infect Dis. (2020) 20:1353–4.
30. Rieg S, Ernst A, Peyerl-Hoffmann G, Joost I, Camp J, Hellmich M, et al.. Combination therapy with rifampicin or fosfomycin in patients with Staphylococcus aureus bloodstream infection at high risk for complications or relapse: results of a large prospective observational cohort. J Antimicrob Chemother. (2020) 75:2282–90.
22. Rieg S, Joost I, Weiß V, Peyerl-Hoffmann G, Schneider C, Hellmich M, et al.. Combination antimicrobial therapy in patients with Staphylococcus aureus bacteraemia-a post hoc analysis in 964 prospectively evaluated patients. Clin Microbiol Infect. (2017) 23:406.e1–e8.
23. Karlsen Ø, Borgen P, Bragnes B, Figved W, Grøgaard B, Rydinge J, et al.. Rifampin combination therapy in staphylococcal prosthetic joint infections: a randomized controlled trial. J Orthop Surg Res. (2020) 15:365.
24. Cheng MP, Lawandi A, Butler-Laporte G, de l'Etoile-Morel S, Paquette K, Lee TC. Adjunctive daptomycin in the treatment of methicillin-susceptible Staphylococcus aureus bacteremia: a randomized controlled trial. Clin Infect Dis. (2020).
25. Tong SY, Lye DC, Yahav D, Sud A, Robinson JO, Nelson J, et al.. Effect of vancomycin or daptomycin with vs without an antistaphylococcal β-lactam on mortality, bacteremia, relapse, or treatment failure in patients with MRSA bacteremia: a randomized clinical trial. JAMA. (2020) 323:527–37.

26. Hagel S, Gantner J, Spreckelsen C, Fischer C, Ammon D, Saleh K, et al.. Hospital-wide ELectronic medical record evaluated computerised decision support system to improve outcomes of patients with staphylococcal bloodstream infection (HELP): study protocol for a multicentre stepped-wedge cluster randomised trial. BMJ Open. (2020) 10:e033391.
27. Thwaites GE, Scarborough M, Szubert A, Nsutebu E, Tilley R, Greig J, et al.. Adjunctive rifampicin for Staphylococcus aureus bacteraemia (ARREST): a multicentre, randomised, double-blind, placebo-controlled trial. Lancet. (2018) 391:668–78.
28. Management of Staphylococcus aureus Bloodstream Infections, Aurelia Kimmig,[1] Stefan Hagel,[1] Sebastian Weis,[1,2,3] Christina Bahrs,[1,4] Bettina Löffler,[5] and Mathias W. Pletz[1,*] Front Med (Lausanne). 2020; 7: 616524. Published online 2021 Mar 5. doi: REVIEW article
29. Multidrug-resistant, extensively drug-resistant and pandrug-resistant bacteria: an international expert proposal for interim standard definitions for acquired resistance ,A-P Magiorakos [1], A Srinivasan, R B Carey, Y Carmeli, M E Falagas, C G Giske, S Harbarth, J F Hindler, G Kahlmeter, B Olsson-Liljequist, D L Paterson, L B Rice, J Stelling, M J Struelens, A Vatopoulos, J T Weber, D L Monnet, 2012 Mar;18(3):268-81. Epub 2011 Jul 27. Clin Microbiol Infect
30. The threat of multidrug-resistant/extensively drug-resistant Gram-negative respiratory infections: another pandemic ,Daniel Reynolds, Jason P. Burnham, Cristina Vazquez Guillamet, Mikaela McCabe, Valerie Yuenger, Kevin Betthauser, Scott T. Micek, Marin H. Kollef . European Respiratory Review 2022 31: 220068;

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INTELLIGENT BIOMEDICAL MEASUREMENT SYSTEM

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ABSTRACT

Early diagnosis of various diseases significantly improves survival. However, more than half of these cases are diagnosed late due to the high demand for colonoscopy - the "gold standard" of screening. Colonoscopy is limited by the outdated design of conventional endoscopes due to the high complexity and cost of use. Magnetic endoscopes are a promising alternative and overcome the cost disadvantages, but their translational phase is difficult to achieve because magnetic manipulations are complex and unintuitive. In this work, we use machine vision to develop an intelligent and autonomous endoscope control that allows non-expert users to efficiently perform in vivo magnetic colonoscopy. We combine the use of robotics, computer vision, and advanced control to offer an intuitive and efficient endoscopic system. Furthermore, we define the characteristics required to achieve autonomy in robotic endoscopy. The paradigm described here can be applied to a variety of applications requiring navigation in an unstructured environment, such as catheters, pancreatic endoscopy, bronchoscopy, and gastroscopy. This work brings alternative endoscopic technologies closer to the translational stage, increasing the availability of early disease treatment.

Keywords: endoscope models, portable, capsule, mobile systems, mobile devices, picture completeness, modern technology

Introduction

Biomedical measurement systems (BMS) play an important role in the detection and diagnosis of various diseases, provide new solutions for healthcare monitoring, and improve bioprocesses and technology for biomedical equipment. In general, BMS uses measuring devices to collect vital signs from the human body, such as heart rate, pulse rate, and body temperature, and then these vital signs are analyzed by a processing unit. Finally, the results are analyzed to help doctors diagnose various diseases. However, it is difficult for old-fashioned BMS (such as portable and non-intelligent ultrasound machines) to obtain vital signs without disrupting the patient's daily activities. Moreover, this old-fashioned BMS requires patients to go to the hospital for examination, which takes up a lot of their time. Therefore, in order to use BMS without disrupting daily activities, these systems must be able to access information in different scenarios. Not limited to situations that require the presence of patients in hospitals, but also abroad, for example, industrial workers, miners, working environments, sports professionals, as well as home settings, military personnel, and individuals. Thus, the use of BMS for today's lifestyles requires that the devices associated with those systems be compact, user-friendly, and user-friendly, even in harsh or complex environments with adequate measurement accuracy. As a result of the emerging requirements, it is aimed to improve BMS by using the latest research and technologies and creating new paradigm medical equipment. IoMT is mainly based on wearable and implantable biomedical measuring devices using tactile, silicon, polymer, and optical-based

sensors and is already integrated into commonly used devices such as smartphones. Wearable IoMT BMS typically include devices such as smart watches, wristbands, glasses, smart helmets, and digital hearing aids. Today, many wearable devices are smart in that they can process signals from sensors locally and transmit measurement data to other connected devices (via a mobile phone or a hospital) over a network.

An endoscope is a periscope for medical or technical "closed space". It is known that the first endoscope was developed in 1894 by Dr. John Macintyre at the Glasgow Royal Infirmary in Scotland (one of the first hospitals to have electricity) to detect bleeding. The use of small-sized medical endoscopes began in the middle of the 19th century and was quite widespread in Europe and the United States. Later, the capabilities of endoscopy (translated from Latin - as "infravision") were also recognized in technology, as it provided "non-destructive" control of technical devices and processes in the most important and popular fields of science and technology. After that, a new direction appeared - borescopes (endoscopic devices that do not have purely "medical" options but fully meet the requirements of some special areas of technology). Later, in the West, new ideas began to appear about the creation of endoscopic complexes that expand and increase the possibilities of studying models. As technology developed, the technical capabilities of endoscopes also changed - the diameter of the inserted tube decreased, and light sources and cameras changed. There are also completely new models of endoscopes - portable, capsule, and mobile systems.

There are four main periods in the development of endoscopy: 1. Hard (1795-1932); 2. Semi-flexible (1932–1958)3; Fiber optic (1958-1981); 4. Electronic (from 1981 to present).

In recent years, endoscopic ultrasound examination (EUS) performed using ultrasound endoscopes of abdominal and thoracic organs is developing more and more. The design feature of such devices is the presence of a scanning device at the end of the endoscope that allows for an ultrasound. The aim of this study is to analyze older models of endoscopes in order to develop more portable models that can be controlled remotely.

The research is based on the theory of finite elements applied to elastic systems, the use of software tools, the principles of theoretical mechanics and robots, as well as the scientific methods of device manufacturing technology.

Main part. Among the various methods of medical diagnosis, methods of recognizing pathologies of human organs based on their color images are one of the actual issues. Undoubtedly, these methods should be related to the methods of obtaining images of human organs. It should be noted that images of organs are obtained during endoscopic and ultrasound examinations. Using a class of diagnostic equipment developed with the help of optical television methods, a color image of the examined human body is obtained, and then the resulting image is processed using special software. As a result of the processing, the specialist gets a picture - based on this, he determines whether there is a pathology in that organ. If a pathological change is detected, the program draws the specialist's attention to it. This improves the quality of medical care provided to the population and reduces the number of medical errors and the time of diagnosis (Table 1.)

The scheme emphasizes an endoscopic method for obtaining color images of the organs and systems of the human body as an optical-television method. In this review, we will briefly focus on mobile devices for endoscopy and other modern technologies used in this field.

Portable endoscopes are devices in which a small imaging system is combined with an actual endoscope. [Son, Gilbert, Sitti: 2019]. This device is compact in size. The PillCam (figure 1-2) is a pill-sized camera that is swallowed and passed through the patient's digestive tract. The device

is specifically designed to detect colon cancer and is now commercially available in more than 80 countries.

Table 1

Imaging of human organs		
Imaging through radiation:	Optical-television methods	Taking pictures using ultrasound:
X-ray of the chest	Endoscopic study	Ultrasound of the organs of the abdominal cavity
Mammography	Diagnosis of the condition of the cervix	
X-ray of the kidneys	Diagnosis of the condition of the oral cavity and nose	Ultrasound of the gallbladder
Angiography	Diagnosis of skin conditions	Ultrasound of the heart and blood vessels
Computed tomography	Diagnosis of the condition of the ear	
Magnetic resonance imaging		

The device itself is a large pill-sized (12 x 33 mm) video camera that allows you to capture color video at 4-35 frames per second from both ends. The built-in LED provides the necessary illumination. The device, which the patient swallows, transmits images wirelessly to a recording device worn by the patient for approximately 10 hours.

Figure 1. PillCam Recorder

Figure 2. Antenna in the form of a PillCam sensor array

The Chinese OMOM endo-capsule (Figure 3) is similar in parameters to the previous example but differs in the presence of a chamber on only one side and slightly smaller dimensions (11 mm x 25.4 mm). The device has a wide viewing angle of 157°, a shooting depth of up to 35 mm, and a shooting speed of up to 7 frames per second. All data is encrypted and automatically sent to a recording device on a special vest or belt worn by the patient. After the study is completed, the capsule naturally leaves the body and the images from the recording device are transferred to the computer. The built-in battery allows the camera to work for up to 12 hours.

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Figure 3. Endo-capsule 10 - Endoscopy capsule for endoscopy of the digestive system

The complex of such technology called "Landish" is a small capsule with a power source and a color video camera. The device requires a compact transmitter attached to the patient's belt, as well as software that will allow doctors to process the received data. The study lasts about eight hours: during this time, the capsule passes through the entire gastrointestinal tract. The device allows you to take pictures 2 times per second. The difference between both capsules is that the second one has several modifications: it allows you to adjust the capsule to a certain area of the digestive system and control its movement. Control is done either by the use of magnets or by an electroactive polymer covering the body of the new capsule (another version of the device). All listed capsules are already used for diagnostics in medicine.

Mobile endoscopes - Portable endoscopes, which we conventionally call "mobile", are devices that consist of a standard smartphone tip and a conventional endoscope that uses the phone's camera and screen as an imaging device and a smartphone storage system [Arnold, Biasio, Leitner:2011]. Such devices have a number of advantages, the main of which is that they offer fairly good quality. Historically, such devices were first used in technological fields, for example, in pipelines, and engines, to take images from inaccessible places, then in veterinary medicine, and only recently this idea began to be used in medicine. We would like to inform you about a few such devices.

A mobile endoscope was developed by scientists from the Department of Otolaryngology at the Taiwan Veterans Hospital (figure 4). - such a long name for a relatively simple device is due to the fact that the device is still in the clinical research stage and the developers have not yet bothered to give it a name[4]. Taiwanese scientists who developed another endoscope that connects to a smartphone hoped that such a device could make it easier for doctors to share diagnostic information about diseases of the ear, throat, and nose.

Tests showed that the device can be used for diagnostics, including consultations with the participation of several doctors, although it does not receive images very well. The developers believe that this endoscope can be considered as one of the options of telemedicine and is suitable for use, for example, in rural areas, and mountainous areas, when there are no other options. The device is very easy to use, even parents can use it to write a clinical description without the help of a doctor. If improvements are made to the device (ensuring the accuracy of the images), it could become the mobile endoscope of the future.

Here we can limit ourselves to referring to the results obtained by the above-mentioned Clear-Scope Smart Phone Adapter by the authorities of the USA and Europe, which they give only after a thorough examination of the possibilities of use of the device as a medical device. Nevertheless, the Department of Urology at the University of California, Irvine decided to evaluate the capabilities and flexibility of the mobile endoscope imaging system.

Figure 4. Taiwan Veterans Hospital Otolaryngology landmark mobile endoscope

To do this, researchers compared the resolution and color reproduction of a mobile endoscope and a high-resolution Storz (H3-Z) camera using a standard flexible cysto-scope. According to the researchers, "the lighter and cheaper mobile endoscope produces images with the same resolution as the Storz-based device with acceptable color reproduction. As assessed by experts in the field of endoscopy, the quality of these photos during the fibro urethroscopy procedure is the same as during fibro cystoscopy - which is slightly lower in quality, but this an image of a mobile device that is still acceptable for use in the procedure is useful and important.

The main advantage of such a device is the simplicity and ease of use compared to the bulky linear cameras required when performing cystoscopy using a standard fiber optic cysto-scope. In addition, the ability to securely record video in the program allows you to show it to patients, which can greatly help in understanding their disease. If you try to do this with standard equipment during cystoscopy, then it does not work, because the patient does not feel anything, except when something is removed from him. A mobile cysto-scope allows you to complete the procedure and only then watch the video and discuss it with the patient. Moreover, we can place these images and videos in the patient's archive or medical record for later use. We combine the use of robotics, computer vision, and advanced control to offer an intuitive and efficient endoscopic system. Furthermore, we define the characteristics required to achieve autonomy in robotic endoscopy. The paradigm described here can be applied to a variety of applications requiring navigation in an unstructured environment, such as catheters, pancreatic endoscopy, bronchoscopy, and gastroscopy. This work advances the availability of early cancer treatment by bringing alternative endoscopic technologies closer to the translational stage.

In some diseases, endoscopic interventions have a higher therapeutic effect and have advantages over surgical operations. Especially in emergency cases, surgery, endoscopic treatment of bleeding, removal of foreign bodies, obstructive jaundice against the background of choledocholithiasis, cicatricial structures of the esophagus, etc. has become the method of choice for The possibilities of operative endosurgery and endourology are expanding, the number of endoscopic operations performed in gynecology, traumatology, and proctology is increasing. Awareness, simplicity, and relative safety of endoscopic methods allow them to be widely used both in hospitals and in outpatient settings.

Conclusions

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Modern endoscopic devices have revolutionized diagnosis and treatment. Their newest versions allow to detection of more structural features of many diseases. However, further studies are needed to evaluate the application of the described new endoscopic imaging techniques in clinical practice. Moreover, there is currently no reimbursement system for examining patients with advanced endoscopic imaging techniques, including endomicroscopy, endocytoscopy, and spectroscopy. Therefore, conventional endoscopy with the collection of multiple biopsies from randomly selected sites remains the "gold standard" for diagnosis. In our opinion, there is a need today for various types of endoscopes that are portable, remotely controlled, and transmit information over long distances.

REFERENCES

1. Son, D., Gilbert, H. & Sitti, M. (2019). Magnetically actuated sof capsule endoscope for fne-needle biopsy. Sof Robot 7, 10–21
2. Arnold, T., De Biasio, M., Leitner, R. (2011). Hyper spectral video endoscope for intra-surgery tissue classification using auto-fluorescence and reflectance spectroscopy // European Conferences on Biomedical Optics, Vol. 8087, SPIE,
3. Clear Scope Sheets - Summit Medicalhttps://www.summitmedicalusa.com › documents
4. Aile Hekimi ve Endoskopi - https://www.researchgate.net
5. Kassim, I. et al. (2006). Locomotion techniques for robotic colonoscopy. IEEE Eng. Med. Biol. Mag. 25, 49–56.

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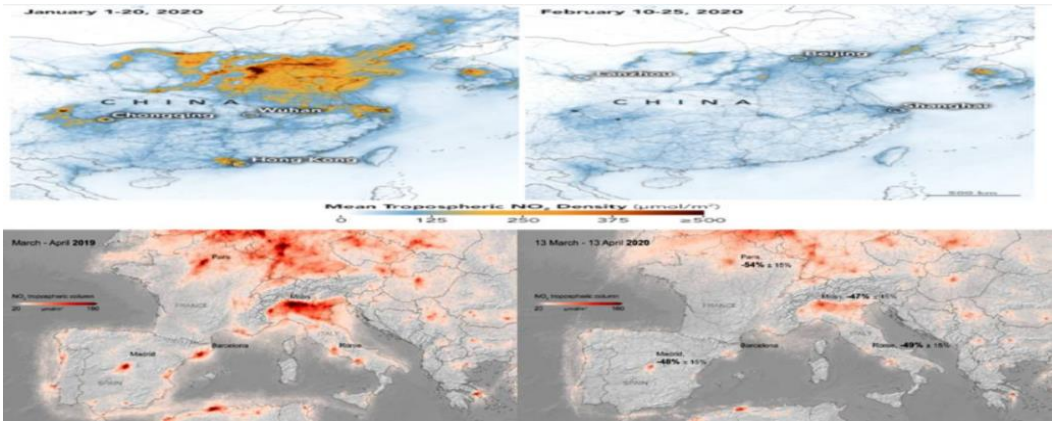

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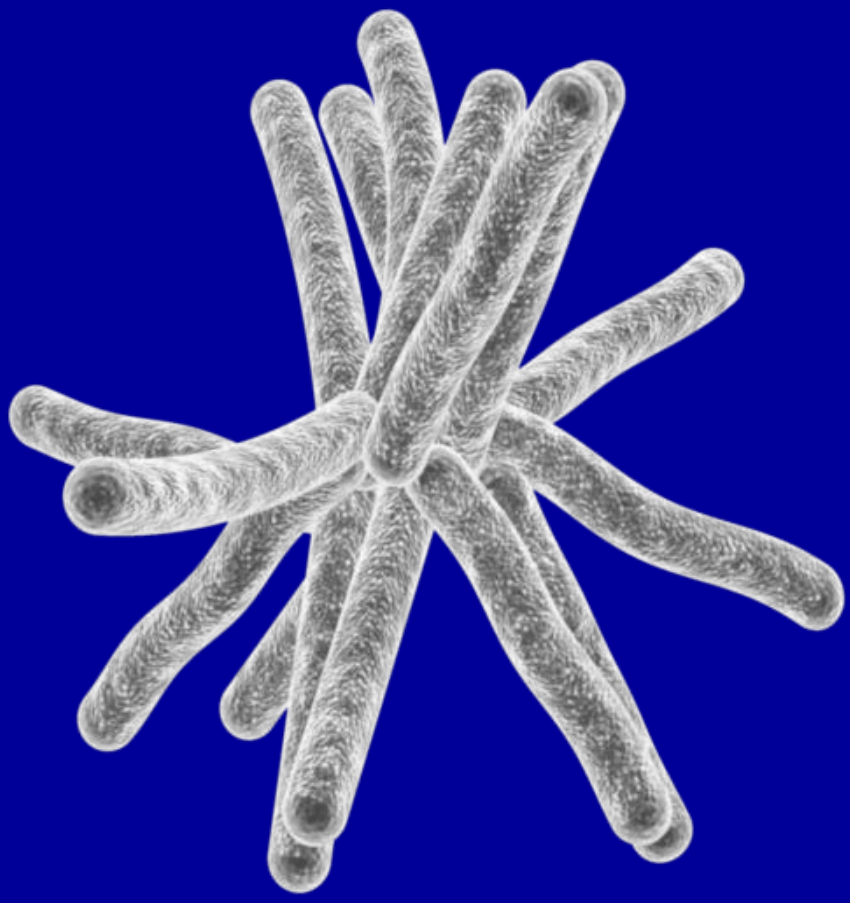

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