

THE TEACHING OF CONDUCTIVE ANESTHESIA.

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NECESSITY OF PRACTICAL COURSES FOR SMALL GROUPS OF STUDENTS WITH INDIVIDUAL INSTRUCTION AND OF PRELIMINARY STUDY OF THE ANATOMY OF THE PARTS INVOLVED.

HAVING taught Conductive Anesthesia for the past five years, I venture now to write my opinion on this subject.

It was comparatively easy for me to outline a successful plan of teaching because I had personal experience here and abroad in being taught medicine and dentistry by different methods. Among these were not only the old didactic lectures, but also demonstrations and actual work. It did not take long to find out that I profited most, where, after preliminary studies and demonstrations, I was allowed to do the actual practical work on the patient under the personal supervision and instruction of the teacher.

On account of the expense and the lack of a large number of teachers, it is impossible for each student to receive private, individual instruction and, therefore, we have to adopt the next best way, which is, the individual but not private instruction of small groups (which means about six students). In the average case, we have found ten sessions, of about three hours each, sufficient to give such a group a good funda-

ment on which to build up, by further practical experience in their own office, and study, a satisfactory working knowledge on the subject. Of course this means that they have to study the anatomy involved and the literature before entering the practical course.

DISCUSSION OF ASEPSIS, SOLUTION AND INSTRUMENTS.

It is to my mind very important to make each part of the study as simple as possible, and then insist that, while under our supervision, everything is carried out exactly as taught.

The sense of asepsis not being well developed in our profession, I lay especial stress on its observation. We must not overlook to correct the students whenever neglecting this important item. For instance, the dentist is very apt to put his hand on the chair or button his coat, etc., after having scrupulously washed his hands. It seems to be more difficult to have him rid himself of these habits than to make him understand that instruments have to be sterilized, solutions boiled, etc. It would lengthen this paper unduly to give the technic of the preparation of the anesthetizing solution dealt with in previous articles. Suffice to say that the complex array of paraphernalia which has been recommended and invented by some men who appear to have a lot of time and money, have

not only scared away a good many earnest men, but are absolutely unnecessary and, thru their complexity, dangerous.

I recently read an article in which

disadvantages. Nothing new can be said in regard to syringes, a number of new and promising ones being still on test.

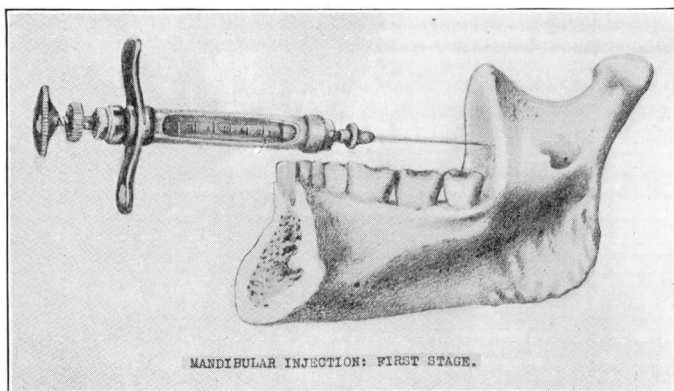


Figure 1.

about half a dozen different needles were recommended. In my experience two needles only are necessary; a long thin steel needle for all injections, except the

DEMONSTRATION OF THE ANATOMY AND ALSO THE TECHNIC OF INJECTIONS ON WET SPECIMENS.

I first received the stimulus to study

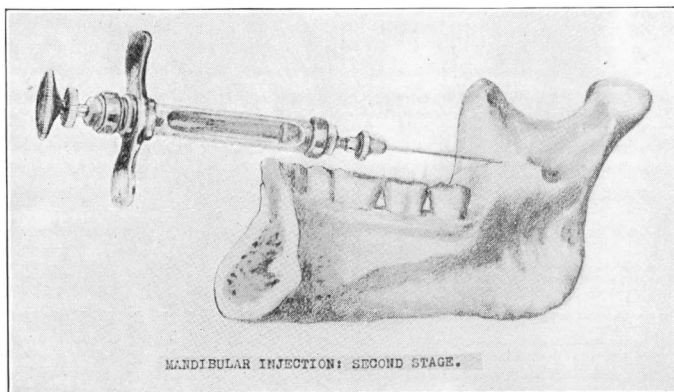


Figure 2.

mandibular, for which a heavier needle is employed. Where iridio-platinum needles are used, one long needle is sufficient. The use of both should be taught, each having its advantages and

thoroly the anatomy of the jaws, thru an article written by Seidel* and then con-

*Seidel: Die Mandibular anaesthesie. Deutsche Zahnheilkunde in Vortraegen.

Heft 28: Leipzig, 1913.

ceived the thought of the importance of using anatomical specimens for teaching purposes. I was encouraged in this work by the ease of instruction (with the help of these specimens) and the comments I heard when demonstrating at the National Dental Meeting in Rochester, 1914.

In my collection there is one head which I have been using for demonstrations ever since I commenced teaching. The head, after being injected by color-

of the region, namely, external and internal oblique line retromolar triangle, etc. In the mental region of the same side a window was cut thru the skin and the parts prepared to give a clear picture of the mental foramen and the structures passing thru it. The left maxilla of the upper half of the specimen was dissected buccally to show the tuberosity and the posterior superior dental nerve in its connection with the main division of the fifth nerve, etc.

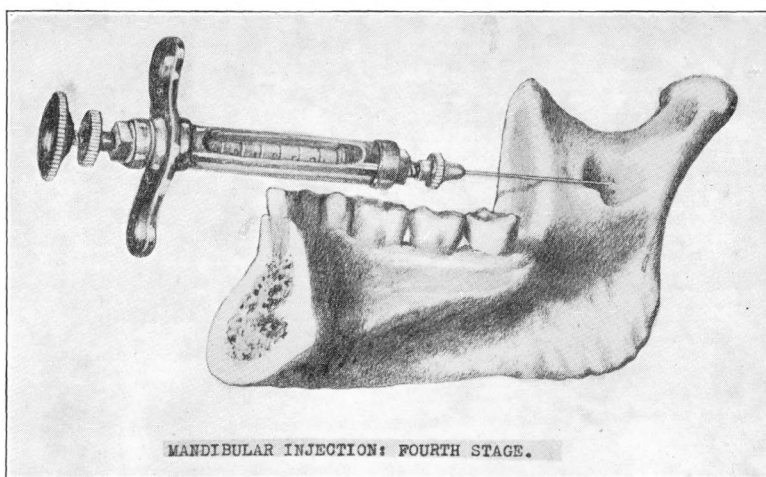


Figure 3.*

*The third stage during which the syringe is turned towards the opposite side so to have the needle point come in contact with the mesial aspect of the ascending ramus is not illustrated because it could only be seen well from a superior view.

ing material and hardened in formalin, was then frozen and cut on the right side horizontally 1 cm. above the occlusal surfaces of the lower teeth, the plane of mandibular injection. After cutting thru the skull the left temporo-mandibular joint was exarticulated. Now I was able to use the lower half of the specimen for two purposes: the right side was a section (thru the plane of mandibular injection) showing all the structures which are of importance; the left side was dissected to give a picture of the course of blood vessels, nerves, etc., thru the pterygo-mandibular space, also the osteology

In the infraorbital region a flap was cut and the infraorbital foramen, nerves and blood vessels prepared. The palatal side demonstrates the structures in that region. I found it extremely useful and successful to be able, after a thorough demonstration of the anatomical parts, to show first the osteology of the ascending ramus, then the passing of the mandibular needle thru the dissected parts on the left side of the specimen and then repeating the technic on the right side by having the needle pass over the section, (which means on the level of mandibular injection), while, of course, in

both instances the palpating index finger remained in position.

With the help of these specimens the advantages and disadvantages of different methods can be clearly shown and easily understood. For the demonstration of the other injections, the simple preparation of the specimen as outlined above is sufficient for the teaching of beginners.

as adults, must be treated individually, one rule not being applicable to all patients. An occasional visitor at times may consider us rough or impolite in handling the patients, but longer observation will teach him as well as we were taught by experience that some patients have to be spoken to very politely and patiently, while with others stern and

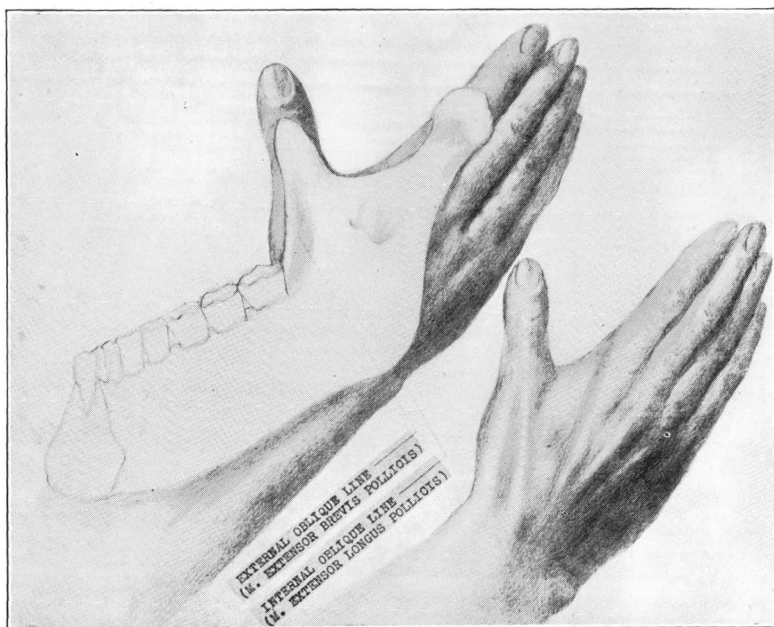


Figure 4.

The back of the hand as used at the chair for demonstrating the ascending ramus of the mandible and the technic of the mandibular injection.

For more advanced students other specimens, especially for the study of mandibular injection, have been prepared at different levels, pictures of which have been published sometime ago.

MANAGEMENT OF PATIENTS.

While one may be even an expert in every phase of the subject, he may fail on account of his lack of ability in the management of patients. The student must watch the instructor very closely in this part of the work. Children, as well

resolute manners must be adopted. To some patients you can explain in detail, if necessary, what will be done, while in other cases again it may be advisable to talk as little as possible without seeming to neglect the interest we have for the patient and the work to be accomplished. It requires experience to read and understand each individual, and we must never lose patience to accomplish our task. Rarely can Conductive Anesthesia not be employed on account of the impossibility of managing the patient.

TEACHING OF PALPATION, INJECTION,
ETC., ON THE PATIENT.

The preliminary study of the anatomy, the demonstration of same and of the technic of the injection on the wet specimen, make the application of the method on the patient so much simpler and easier. In regard to palpation the student must become familiar with the fact that the best palpation can be accomplished with the index finger only, and that this finger must be employed for this purpose in all injections with the possible occasional exception of the mental. We must learn to palpate gently and carefully without causing the patient the least pain or even discomfort. We must understand palpation is successful only if done lightly, as the different types of tissues cannot be distinguished if the palpating finger rests heavily and presses hard upon the underlying parts. The operator must stand a certain distance away from his patient, so that the neighboring joints, like the wrist and elbow, are not actually bent but nearly straight and at ease. This is best accomplished by standing in front of the patient, as I believe all operations in Conductive Anesthesia as well as Oral Surgery should be performed. Altho nearly every student objects when asked to make certain injections (mandibular, infraorbital) on the left side with the left hand, still they learn very quickly to manage the syringe with that hand and I must say that I cannot see any reason why a dentist who does a good part of his daily work with the left should not make an attempt at it. In fact each one of them ridiculed afterwards his fear that he would not be able to work except with his right hand. I must admit that being naturally left handed and having been forced to use also the right hand, put me in a position where I can use both hands equally well. In that way I found out that a mandibular or infraorbital injection on the left side can be more easily and better ac-

complished by palpating with the right index finger and injecting with the left hand, especially if we agree that all operations should be performed while standing in front of the patient. The student must remember that when injecting, the solution should be of about body temperature, that the syringe must be gently handled and held in the hand like a probe so that the needle will easily stop at a point of resistance and surely work itself into its proper position without bending or breaking and without injuring the anatomical structures with which it comes in contact.

OTHER ADJUVANTS IN DEMONSTRATING
AT THE CHAIR.

A few years ago I discovered, if I am permitted to call it so, an adjuvant for the teaching of mandibular injection which I consider extremely helpful in demonstrating at the chair.

I found, by abducting and extending the thumb from the index finger, a picture is created which wonderfully resembles the structures encountered on the ascending ramus of the mandible. The tendons of the extensor brevis pollicis and extensor longus pollicis form the external and internal oblique lines, while the groove ("snuff-box") between them makes up the retromolar triangle. By following tendon, representing the external oblique line upward, we reach the tip of the thumb forming here the coronoid process, while the circular line from the thumb to the index finger resembles the sigmoid notch. The tip of the index finger may be called the condyloid process. The back of the hand corresponds to the inner aspect of the ascending ramus.

The whole technic of mandibular injection can thus be demonstrated at the chair without the anatomical specimen. Each hand can be used to represent the corresponding mandible, and the palpation and demonstration of the injection can be done with the free hand.

In the same way the tuberosity injec-

tion can be shown by representing the buccal roots of the second molar with the first and second fingers and of the third molar with the third and fourth fingers. We can now explain that the insertion of the needle is made at a point which corresponds to the middle of the disto-buccal root (represented by the second finger) of the second molar and that the needle then proceeds upward and backward over the apices of the buccal roots of the third molar (represented by the third and fourth fingers).

Again, in demonstrating the anatomical position of the mental foramen, we can use the palm of the hand, assuming the lower part of the palm to be the lower border of the mandible, the line connecting the roots of the fingers as the alveolar border and the first and second finger as the first and second bicuspid. Then we can show that, in a vertical direction the mental foramen lies either below the second bicuspid (represented by the second finger) or below and between the two bicuspids (represented by the first and second fingers), in a horizontal direction, in the middle between the alveolar border (represented by the line connecting the roots of the finger) and lower border of the mandible (represented by the lower border of the palm of the hand).

One must be in a position to sketch clearly the anatomical structures in their proper relation, so as to be able to demonstrate and explain quickly the points in question without having many different sections and dissections at one's disposal. Most frequently we are called upon to draw the pterygo-mandibular space and containing structures, also the position of the needle during the different stages of the mandibular injection.

LACK OF SUCCESS DUE ONLY TO NEGLECT OF THE ABOVE IMPORTANT PRINCIPLES.

To be successful one must have small classes with individual instruction and

not only time but also a great deal of patience.

I can frankly say that while teaching is often quite strenuous and tiresome, it always has given, and still gives me, a great deal of pleasure and satisfaction, as we ourselves learn while teaching others.

PREVIOUS PAPERS READ ON LOCAL ANESTHESIA.

"Local Anesthesia," *Items of Interest*, March, 1914.

"The Technic of Conductive Anesthesia," *Dental Summary*, February, 1915.

"Mandibular Anesthesia," *Dental Cosmos*, January, 1916.

"Notes on Conductive Anesthesia," *The Journal of the National Dental Association*, October, 1917.

DISCUSSION.

(Read by Dr. S. L. Silverman, Vice-Chairman, in the absence of Dr. Ivy.)

Robert H. Ivy, Milwaukee, Wis.

My discussion of Dr. Blum's excellent paper will be necessarily limited owing to my agreement with him on practically every point. To my mind there is scarcely anything in it that should not be emphasized. Simplicity of armamentarium and aseptic technic is the keynote of success in conductive anesthesia. I see no practical reason for the employment of freshly distilled water, Ringer's solution, special porcelain dishes, needle guards and other paraphernalia that tend to frighten away the average practitioner and make him think that the method is something beyond his reach. All of these frills may be dispensed with with perfect safety and success, even though each one may have a theoretical justification. A steel needle is every bit as good as a platinum one as long as it is sterilized by boiling. Ordinary boiled water rendered isotonic by the addition of sodium chloride in the proper amount is absolutely harmless in the small amounts employed for injection. It has been used in this way for several decades in hospitals in subcutaneous infusions of 1000 cubic centimeters without damage

to the tissues. The solution can be boiled just as well in an ordinary tablespoon as in a fancy porcelain container. More emphasis should be placed on sterilization and cultivation of the sense of asepsis and less upon any special armamentarium. Syringes should be boiled before use and not kept in uncertain antiseptic solutions. The use of the hand as a model for demonstration purposes seems to me to be excellent. Ever since taking up the use of conductive anesthesia, which was before Fisher's visit to this country, it has been my habit to make the left mandibular injection with the right hand and that of the right side with the left hand. Tho not naturally left handed, I am convinced that with a little practice this habit can easily be acquired by anyone, and its convenience is unquestionable. The essayist is to be heartily congratulated upon the simplicity and, at the same time, the thoroughness with which he presents the subject to his students.

Arthur E. Smith, Chicago.

It gives me great pleasure to enter into the discussion of Dr. Blum's paper, and I wish to compliment the essayist upon the manner in which he has presented the subject. I agree with everything in the paper with but two or three exceptions. I do not employ or advise the use of steel needles for deep nerve blocking injections nor do I use as few needles for all classes of local anesthesia as the essayist recommends. Personally, I employ platinum-iridium needles of known length and diameter for the routine injections, with the exception of blocking the terminal division of the infra-orbital nerve by the extra-oral method and for the initial injection prior to producing intra-osseous anesthesia. From personal experience I have found that I can do better work by employing several needles—say four or five—than to try to make all the various injections with one or two. When I say this number it includes the needles em-

ployed in the injections for extra-oral and intra-oral methods. This includes the various nerve blocking injections; terminal or infiltration, intra-osseous and the deep intra and extra oral injections. This, however, is due to personal experience and the operator who uses but two needles can probably do just as efficient work for certain injections, but when we consider all the methods of producing local anesthesia as I have already stated, it certainly requires more than two needles.

The subject of Dr. Blum's paper, namely, "The Teaching of Conductive Anesthesia," is a very important one at this time, for the reason that so many members of the profession are vitally interested in the relief of pain while performing dental operations. A great deal of credit is due Dr. Blum for the work he has done along this line, and it was my pleasure to observe the anatomical specimens he prepared while I was in New York several years ago. In the teaching of nerve blocking the use of properly prepared wet-anatomical-specimens are of immeasurable value, for they give the student a much quicker and better knowledge of the anatomical structures with which he should be familiar before attempting the various nerve blocking injections. If one is not familiar with the anatomical parts, the relation of the bony-landmarks to the various nerve branches, arteries, veins, foraminae, he is not going to make the injections in an intelligent manner. Many dentists think all that is necessary in order to carry out this important phase of anesthesia is to have a hypodermic-syringe, a needle and the injecting solution, but allow me to say, that a thorough knowledge of the subject is far more important than all the equipment put together. The operator who attempts to make the deep injections, without first familiarizing himself with the subject in all of its details, will no doubt encounter numerous failures. It has been my pleasure to prepare a number of wet-

anatomical-specimens to show the various structures as they are found in life. It has been very gratifying to me to have the opportunity of spending hours in the preparation of specimens for nerve blocking injections in oral surgery, dental and throat operations, such as the removal of the tonsils, and to have discussed them before various societies and study clubs. Tomorrow and Friday some of these specimens will be shown in the illustrated clinic with motion pictures.

In the absence of Dr. Ivy I regret to take exception to a part of his discussion with reference to distilled water. He says it is not necessary to use freshly distilled water; if it is kept in a suitable container, or is boiled to render it sterile. According to the teachings of bacteriology we are aware of the fact that it is necessary to boil water for a period of fifteen minutes, each day for three consecutive days in order to render the solution sterile. Distilled water does not mean sterile water, by any means, and it is always better to prepare the distilled water fresh every morning, than it is to keep a stock solution on hand for an indefinite period of time and take chances on injecting a solution which does not conform to the law of bacteriology. I wish to say a few words with reference to my findings with Ringer's solution. From the offices of ten Chicago operators I obtained samples of their stock Ringer solution, and took them to the bacteriological laboratory and made tests. Bouillon was inoculated with each sample, and after a forty-eight hour growth the specimens were transferred to petri dishes containing agar-agar; out of the ten specimens nine gave positive cultures. Out of ten specimens of stock distilled water, obtained in the same way, ten gave positive cultures. This should prove that stock distilled water and Ringer or Normal Saline solutions are by no means sterile. Many dentists do not boil their distilled water or

Ringer solution, dissolving the tablets without taking any precautions whatsoever. In case sepsis follows such unscientific technic, they ought not to blame nerve blocking, but should place the blame upon themselves. It is quite true that nature is very kind in combating infection, but we cannot expect the impossible in every case. It might be of interest to some of you to know that I have perfected the technic for anesthetizing the tonsils. I do not mean anesthetizing them by the infiltration method, as is being used, but I mean anesthetizing them thru the medium of nerve blocking. Time will not permit me to discuss this phase of the work, but just in a few words will say that the tonsils are completely anesthetized by blocking the palatine nerve branches which are given off Meckel's Ganglion in the speno-maxillary fossa; and the tonsillar plexus, which is derived from branches from the glosso-pharyngeal, uniting with branches from the pharyngeal plexus. Two injections are necessary; one for the plexus and one for the palatine nerves. A straight needle with an extension hub is used for the plexus injection. The same needle is used with curved hub and extension for the palatine branches as employed for blocking the second division of the fifth nerve, on the posterior lateral surface of the superior maxillary bone. Complete anesthesia is produced within a few minutes following the injections and tonsillectomy is made a painless operation, and last but not least the operator has the co-operation of his patient and no inspiration of blood and mucus.

In closing I again wish to compliment the essayist upon his paper, and I know you have profited very much from it. Remember that thoroughness is the keynote to success, and after you have thoroughly mastered this important link in your duty to mankind, you have added a method to your practice which will repay you many times for your effort in gratitude from your patients. We know

that the easiest way to earn gratitude, is to relieve pain, and this can be accomplished thru the various mediums which science offers today. Science has shown both medicine and dentistry, many valuable things within the past few years. They have opened new fields to the man who wishes to progress in his profession. The field of anesthesia is surely a large and scientific one, and the modern dentist of today should take advantage of those methods which science affords him. The subject of anesthesia is certainly a broad one, and no single anesthetic is 100% perfect; therefore, in order to attain the highest ideal, we select the anesthetic and method which is best adapted to the individual case. But I think when nerve blocking injections are skillfully made that a very high percentage of cases will meet the approval of the most exacting operator. In order to obtain the best results the technic must be mastered and a strict adherence to dosage, isotonia and sterility of the injecting solution must be followed. And last but not least strict asepsis must be observed at all times. I wish to thank Dr. Thoma for calling on me to enter into the discussion of this important subject.

Richard H. Riethmüller, Montclair, N. J.: It seems to me that the discussion has drifted away from the subject. We are, I regret to say as dentists continually fiddling around from pillar to post, every man having a different method, and a great deal of conscientious effort is wasted because we lack standardization. Dr. Blum's effort aims dis-

tinctly at standardization and unification. The more suggestions of this sort we receive and abide by them, the better it will be all around. We don't want fifty methods of conductive anesthesia; we only need one, because human anatomy is more or less the same, the distribution of nerve branches is fairly uniform; and,—the basic principle being the thing,—one generally endorsed and accepted method is sufficient.

CORRECTION OF DISCUSSION.

Dr. Blum:—Dr. Riethmüller has been kind enough to close the discussion for me. I must agree with him that the discussion of Drs. Silverman and Smith, while interesting, covered other subjects than the one dealt with in my paper.

In regard to steel needles, I wish to say that while I have no objection to the use of iridio-platinum needles, I would advise all of you who teach Conductive Anesthesia to have your students use steel needles at first, because they do not bend easily. After they are familiar with the technic they can choose any needle they prefer. The thin steel needle should never be used for mandibular injections.

If I understand Dr. Ivy's discussion correctly, he stated that ordinary boiled water would answer the purpose as well as sterilized. Even tho this were the case, on account of the small amounts we use, I would not teach its use to students, because it would increase the usual carelessness found in our profession regarding exactness in this connection. It is very important in teaching to be as strict as possible with every detail of the work.