the laryngeal muscles and nerves," which makes the abductors more susceptible and causes the symptoms of slight pressure to manifest themselves in the nature of interference with the respiratory function.

In a certain proportion of cases the stage during which the abductors alone are involved is extremely short or does not exist at all. This is particularly true of cases in which the enlargement of the aorta occurs itself suddenly or is principally in the anterior wall of the aorta. Here the pressure is made almost complete at once and involves the pneumogastric as well as its branch, the inferior laryngeal. The symptoms of increased pressure are those of complete paralysis of the recurrent laryngeal, namely, the loss of motion of all of the intrinsic muscles of the larynx except the thyro-arytenoid. These muscles include the adductors, the principal of which are the lateral crico-arytenoid, the internal thyro-arytenoid, the tensors, and the arytenoid. It is obvious, therefore, that when the nerve is completely paralyzed and both abductors and adductors fail to act, that the vocal bands be neither abducted nor adducted, nor will they be made tense, but will rest in a position midway between abduction and adduction and be lax. This position of the vocal bands is what is known as the cadaveric position.

The dyspnea in the case of Kiler may be explained either by pressure on the trachea or bronchi, or it may be due to so pronounced a pressure upon the pneumogastric that the irritation is transmitted to the center in the medulla, then to the opposite side, causing spasm of the opposite abductors. In this way pressure upon one pneumogastric will cause marked bilateral manifestations, especially giving rise to laryngeal dyspnea.

It is important to recognize whether that dyspnea be due to this cause or to pressure upon the trachea or bronchi. If due to the former, tracheotomy will relieve the urgent distress, and if due to the latter, opening into the trachea will be of no avail.

As has been seen in the case of the man Kane, the voice while aphonic from the beginning has gradually improved. This is not an uncommon manifestation, but should not be construed to mean improvement in the actual condition. One vocal band may be completely paralyzed, remaining midway between abduction and adduction, while the other in course of time takes on compensatory action and passes beyond the median line to closely approximate the paralyzed band. When this exaggeration of the unparalyzed vocal band takes place, the voice begins to return, and while the patient will never have a normal voice, he will nevertheless be able to phonate better than early in the affection. There is marked distress during prolonged phonation due to what might be called respiratory loss. The chink of the glottis being larger than normal every act of phonation permits an increased loss of breath and the patient becomes rapidly exhausted in an attempt to use his voice.

AN ANALYSIS OF TWENTY-ONE CASES OF PELVIC ABSCESS TREATED BY VAGINAL SECTION.

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THE following article has for its object the consideration of 21 cases of vaginal section for pelvic abscess in which the end results are known. They have been collected from the cases treated at the Boston City Hospital and from private practice. Hospital records show the immediate results of operation; but as a rule our patients disappear at once on leaving the wards or after a few visits to the Out-Patient Department. For this reason the end results are seldom apparent.

The responses to our requests for information from hospital patients have been few, as out of about 100 inquiries, only 13 replies have been received. All have been examined personally; but in speaking of the end results, four are mentioned from whom reports have been received. It must be borne in mind that the impression conveyed by such a series of hospital cases is often really worse than the actual truth, as many are traced after discharge, only from the fact that they have improved slowly. The greater number of those making good recoveries disappear.

The "end results" we have considered as the condition of patients at the time when the maximum benefit from the operation was apparently attained. In one or two instances it may be considered a little doubtful whether they have quite reached this stage; but in general, we believe this period has been reached.

General Considerations.—Vaginal section for the evacuation of collections of pus in the pelvis has long been recognized as an operative procedure having less danger in acute stages than ordinary abdominal section; but at the same time, opinions have varied as to the lasting results obtained by this method alone.

The bacteriology of the pelvic abscess is often unsatisfactory, as there are numerous accidental means by which a swab may be contaminated, and, furthermore, many are reported sterile. Any classification on a purely bacteriological basis seems impracticable.

In a clinical sense, these abscesses may be divided into three classes: first, those arising shortly after gonorrheal infection; second, those which appear at some more or less distant period after gonorrheal infection; third, those following puerperal sepsis. Regarding the second class, we must allow that such abscesses may be due to the lighting up of old quiescent foci or a new infection by a different organism, regulated more or less by the resistance of the individual and started, perhaps, by some traumatism. The rare infections from the appendix and tuberculosis are not considered. Certain of the acute gonorrheal cases progress at once to abscess; but many do not go so far, and leave in their wake lasting discomfort, pain and repeated attacks of pelvic peritonitis. Often the amount of pus

present is small. After more or less frequent disturbances or a long period of seeming immunity, suddenly an abscess develops, either confined to tube and ovary, or to a limited part of the pelvis. This is the type in which we believe a secondary infection occurs, often with a different organism, even if as yet we are unable to prove it to our satisfaction bacteriologically.

In the third class, the infection (often streptococcus) comes as the result of miscarriage or childbirth and travels to the peritoneum by way of lymphatics or tubes, or both. Frequently in these cases we find the tubes have suffered comparatively little injury, and the collection of pus is localized in the broad ligament, or, very often, is apparently an infected peritoneal secretion which has gathered in Douglas' pouch. If seen early, the serum poured out may have undergone no change, and on vaginal section, we find perhaps a pint of clear or slightly turbid fluid. After a time it has the ordinary appearance of pus. These patients do well when such fluid collections are drained, and the temperature will promptly fall. They also recover with very slight signs of any previous trouble; although the exudate may be considerable.

Another contrast exists as regards adhesions. In the third class they are light and friable, while in the first two they are more firm, especially in the second class.

This seems due to something more than chronicity; as in a number of abdominal sections, where the infection was known to be from the common pus organisms, the adhesions have been light and entirely different from those of known gonorrheal infections of apparently the same duration. It is also very noticeable that in the third class, the abscess may increase rapidly in size, and occasionally ruptures, with disastrous results, from this want of adhesions. It follows, therefore, that masses in the pelvis, after childbirth or miscarriage, should receive very careful attention. The second class runs a more chronic or subacute course and, in the main, gives abundant warning before rupture takes place.

Age.—Most pelvic infection occurs during the child-bearing period, but in the one case, which was over fifty years, the abscess healed promptly, although the general condition was poor.

Probable cause.—The probable cause of the infection was: Puerperal sepsis, 8; gonorrhea, 9; unknown, 4.

Puerperal sepsis, especially after induced abortion, and gonorrhea, are the principal causative factors of pelvic abscess; although in certain instances, neither of these seems to blame. The writer has seen one large pelvic abscess arise from a tubercular tube. We know that abscesses of Bartholin's glands occasionally develop in uncleanly persons, and some German writers have claimed the sepsis after labor is due oftentimes to coitus shortly before delivery. In some hospitals the subject is always inquired into at entrance. The fact that pelvic adhesions are occasionally formed in individuals where there seems to have been no previous coitus, may allow

us to grant that very rarely such an abscess may develop "idiopathically."

One of our own cases, who underwent two vaginal sections for pelvic abscess, never had any symptoms of gonorrhea and was never pregnant. The culture from the abscess at the first operation showed staphylococcus pyogenes albus; that of the second was sterile. A second case of similar nature gave a negative result.

Puerperal sepsis and gonorrhea appear from our returns to give rise to pelvic abscess in equal proportion. In 6 cases, the infection was undoubtedly gonorrheal in character and probably so in three others.

There is only one reported culture from these 9 cases and that was sterile. Of the eight abscesses which resulted from puerperal sepsis, four were reported as streptococcus infections, and three sterile.

Duration of symptoms.—In the gonorrheal cases, the symptoms may be roughly divided into two stages: premonitory and acute.

The premonitory stage consists of the period during which there is discomfort or pain, either continuously or at intervals. This period is usually well marked and of variable time.

The bulk of the gonorrheal have had symptoms from one to two months before acute attacks set in.

Two of these cases have had abscesses form after a considerable period of time had elapsed since the venereal disease was contracted. One case, in which the time of infection is definitely known, was in very good health for two years before the acute symptoms appeared. Another enjoyed fair health for many years before the abscess formed. It seems to me reasonable to suppose that such accidents may be due, as has been stated before, to the reinfection of damaged tissue through blood or lymphatics. This might be brought about by any traumatism in tissues whose resistance is already weakened by previous inflammation. Of course the health of the individual would also have a marked influence. The new infection with a different organism seems more plausible than an old quiescent focus, as the virulence of most pus-producing organisms becomes much attenuated and the organisms often disappear altogether.

After puerperal infections, in many of which we know the exact date of induced abortions, there is often the same premonitory stage. Among those on our list it has varied from four days to ten years, but is usually of two to three weeks' duration. The longer period mentioned would seem to indicate a second infection.

The acute stage in the gonorrheal has varied from five days to five weeks, averaging about two weeks before operation became necessary.

With the puerperal cases, nearly all of which were streptococcus infections, the time elapsing from the acute onset to the time of operation varies from four to twenty-one days, with an average of about ten days. This is a much more rapid development than in the gonorrheal infections. It is in the puerperal cases that ad-

hesions form slowly and are very frail, while the abscesses increase very rapidly. In the case in which operation became necessary on the fourth day after miscarriage, a large amount of serum was evacuated.

Condition of pelvis at time of operation.—It is difficult to summarize the condition of the pelvis, as in most instances the structures were so obliterated by adhesions and exudate that it was impossible to tell whether the pus came from an enlarged tube alone, an abscess cavity with which the tube connected, a collection of pus in Douglas' pouch, or an abscess in the broad ligament.

As a general statement it can be said that the amount of pus evacuated from the abscesses forming after puerperal sepsis was about equal in amount to that from those women known to have been infected with gonorrhea within a short time.

The connective tissue of the pelvis was filled with exudate in all cases, and it seems impossible to tell to just what extent the appendages were involved; but from the findings at other laparotomies, it would seem probable that both sides were more or less involved, although the abscess may have been more directly connected with one or the other. In one case with no apparent cause of infection two sections were performed, two years apart, for abscesses which formed first in one tube and then in the other. The writer has also operated upon one gonorrheal case in which the sections were separated by an interval of about two weeks.

Five acute abscesses after fresh gonorrhea appear to have been confined principally to one tube. The abdomen was opened in one of these, after the acute symptoms had subsided, and the damaged tube removed. The abscesses have pointed behind the cervix with one exception. Two of the cases have been treated by laparotomy after the initial operation, — the case mentioned above, and one other, — which developed an abscess between the peritoneum and abdominal wall, above the bladder. In two, the anterior wall of the rectum sloughed.

End results.—The sinuses have healed quite promptly in most instances, especially in the acute gonorrheal abscesses. The shortest time recorded is six days, and the longest, five weeks. The puerperal infections have not shown quite equal speed. One has discharged for four months and perhaps this case can hardly be considered an end result. Of the two patients with sloughing of the rectal wall, and both having recto-vaginal fistulae, one sinus persisted two and one half years, until death caused by an operation for its closure; and one healed inside a month.

The time elapsed since operation in the cases seen and examined is: Less than six months, 4; between one to two years, 8; between two to three years, 6; between three to four years, 2; between four and five years, 1.

Of patients examined under six months from date of operation: One was seen five months; 2 at four months; and 1 three months after section. All were of puerperal origin. The case

operated five months ago, still has some mild attacks of peritonitis from time to time, and there is exudate in the pelvis on one side. This woman, on account of home conditions, has been unable to give herself proper care. She has some pain with menses; but has gained twenty pounds since leaving the hospital, although she was extremely sick while there, losing sixty-five pounds.

The two cases seen four months after operation have painless catamenia and suffer none. In one, there is a retroverted uterus with two small tubo-ovarian masses adherent. The whole is movable. In the other, there is a retroverted uterus with a small mass at one side. Both uterus and mass are free.

In the single case observed at three months, there is still an indurated mass in the left broad ligament. The uterus is in good position, freely movable, with no tenderness.

Of the cases seen between one and two years after section, two, with abscesses of unknown origin, are in good health. One of these has slight pain at times, and examination is negative; the other has no discomfort, but a slight thickening behind the uterus.

Of the probable gonorrheal infections, four in number, three report slight pain occasionally. One of these has a small mass on one side; two have adherent retroversions of second degree; and one has a slight thickening on both sides, but the pelvis otherwise negative. The two cases with second degree retroversion have pain with the catamenia.

The cases (2) of puerperal sepsis have no pain, and the pelves seem practically normal.

Six women have been examined from two to three years after discharge. One, origin of abscess unknown, has slight pain at times, an adherent tube in the pouch of Douglas, and slight pain at the monthly period.

One severe case of pelvic infection has gained sixty pounds, has no pain at any time, and it is possible to find but a slight thickening of the broad ligaments.

Of four probable gonorrheal infections, one has slight pain at catamenial period; one, no pain since the operation; one, pain until the appendages on left side were removed by laparotomy, since which time she has had perfect health.

The fourth case in this group is the only one resulting unfortunately. This has been mentioned previously. About a week after the vaginal section, the anterior wall of the rectum sloughed and a recto-vaginal sinus appeared which also connected with the large abscess cavity. Later a laparotomy was performed to drain a pus cavity between peritoneum and abdominal wall above the bladder. She was in poor condition at the time of each operation, thoroughly septic, and barely lived.

The second abscess cavity finally connected with the one in the pelvis and a sinus formed in the abdominal wound. Both sinuses refused to heal, although all means were tried. She was finally operated upon two and one-half years later, and died from shock. During the interval

between her discharge from the hospital and the final operation, she enjoyed very fair health. The outlook was desperate from the start.

Two women reported between three and four years after operation. The first is perfectly well and the pelvic examination is negative. This infection was undoubtedly gonorrheal. The second was again admitted to our wards a short time ago, with a large exudate behind the uterus; but by rest and depletion, operation was avoided. She considered herself as perfectly well until three weeks previous to entrance. The original septic process started from a miscarriage, and it seems rather probable that the second infection was of a different nature.

Only one patient has reported after four years, a probable gonorrheal infection. She declares herself comfortable. At the time of leaving the ward, her weight was 86 pounds. It is now 140 pounds. The uterus is quite firmly fixed in the pelvis, and in good position. There is a slightly movable tubo-ovarian mass on one side, an old vaginal scar on the other.

In none of our cases has pregnancy occurred since the operation.

Four report themselves as in good health after periods of from six months to two years; but the data concerning them are insufficient.

Conclusion. — Our cases, few in number, show this operation gives what appear to be good results. One has died, not as the result of the operation itself, but because of an effort to correct the consequences of an operation upon a metastatic abscess.

Two other unfavorable results are reported: one finally cured of pain by removal of one tube and ovary; the other still with some pain and exudate, owing principally to lack of proper care.

Thirteen on our list are free from pain, and four others, reporting by letter, claim to be well. The remainder have some pain at times, but the discomfort is apparently slight, even if some exudate, thickening, or tubo-ovarian masses remain. It will be noticed, also, that with exudate there is not always pain or even tenderness. If we could compel our patients to follow after-treatment with care and enable them to accept the opportunities offered for rest, the results would be far better.*

A NEW OPERATION FOR CORRECTION OF THE NASAL SEPTUM.

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PERHAPS the most objectionable feature of the present submucous "window operation" is the length of time it requires to perform it, together with the strain on both patient and operator. Both of these disagreeable features are overcome by the operation herein described.

*The writer is indebted to Dr. D. D. Scannell for details of some private cases.

In the usual operation, after separating the mucous membrane and perichondrium from one side of the septum, it is often very difficult to free the opposite mucous membrane through the septum without causing a perforation. This part of the operation is also most fatiguing for both patient and surgeon.

The author's operation is divided into two short sittings, which many patients are able to tolerate, rather than one long one which is exceedingly nerve racking and even quite impossible for the more sensitive.

It is not suggested that this operation take the place of other "window operations," but rather it is one to be used when the conditions are unfavorable for prolonged surgical procedures. The author can, perhaps, best explain the technique by describing the first case operated on, as it was typical of those cases for which this operation is especially adapted.

On examination of the nose, the septum was found deviated as in Fig. 1, that is, the cartilaginous septum was in contact with the lower left turbinate. Only a small piece of the bony septum was involved. A more or less perpendicular incision was made in the right nostril anterior to the deviation, after first applying cocaine and adrenalin, and sterilizing the cavity with a weak solution of corrosive sublimate.

The periosteum elevator was then introduced through the incision beneath the periosteum and perichondrium and worked backward, upward and downward, until they were free from the septum as far as the edges of the deviation. The space thus made was injected with sterilized vaseline, and the nose allowed to heal for one week. It may be seen that the mucous membrane and perichondrium, instead of following the line of the septum as in Fig. 1, were held away from the septum by the vaseline and took the line C D, as in Fig. 2.

After one week the opposite side was prepared for operation in the same way as the first, and an incision similar to the one on the right side, only somewhat more anterior, was made. This last incision was made more anterior in order that it would not come opposite the other and increase the liability to perforation in case the first was not entirely healed. In the same way as before the perichondrium and mucous membrane were separated from the septum. With the mucous membrane and perichondrium on the right, tak-