A NEW INSTRUMENT FOR TONSILLECTOMY.

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A study of medical history reveals a startling complexity and variation in the instrumentarium developed by our profession for the purpose of operation on the tonsil, and although the early workers along this line had not the ideal of complete removal of the gland as their goal it was through the application of the fundamentals worked out by them that the present standard of procedure was evolved. This evolution began with the devising of an instrument for the removal of the uvula by "a Norwegian Peasant, Canute of Thorbern" as described in a historical volume published by Thomas Bartholin in 1641 and referred to by Friedberg in an excellent paper on "The Evolution of the Tonsillotome"¹. This instrument embodied the principle later used in the tonsillotomes, that of an aperture through which the organ was to be drawn while a blade was forced down against it for the purpose of cutting it off. From this early beginning the tonsillotome underwent numerous modifications at the hands of different workers but without any change in the basic principle of the operation, that of a fenestrum through which the organ was to be pressed or drawn and a blade of some description for the purpose of severing the part to be removed. The best known of the modifications of this original idea, among the older instruments, was the tonsillotome of Physick, described by him in 1827 and later popularized by Sir Morrell Mackenzie. A further modification of this principle and the only other one that requires specific mention was the Mathieu or "French" instrument. The Mackenzie, or "English," instrument, was characterized by a handle at right angles to the axis of the blade in contradistinction to the Mathieu, which had no such modification.

The ligature, of which the cold wire snare is a development, was used even earlier than the instruments mentioned above; no accurate record being obtainable as to its earliest application to this form of surgery. It had, however, little popularity as compared with the use of a blade until the development of the principle of complete removal of the gland.

To Pynchon belongs the credit for the pioneer work in this departure from the original method of cutting off the projecting portion of the tonsil only, but in his fear of the ensuing hemorrhage he was led to the use of the electro-cautery to dissect it out, his

object, nevertheless, being the complete removal of the organ at one sitting. Following Pyncheon, Ballenger developed his idea of complete tonsillectomy, using the principle of dissection followed by snare, although he also used his *ecraseur* to complete his operation. Its action was very similar to that of the snare, a dull blade being substituted for the wire.

It may be seen then, that up to the time of Sluder's contribution to the subject of tonsillectomy in 1911² the complete tonsillectomy had not been performed by the use of the blade, intentionally and systematically. It remained for Sluder to perfect both technique and instrument to that end. His instrument, familiar to everyone doing the tonsil operation, was modified from the Mackenzie tonsillotome by being made stronger and shorter and his technique of complete removal by this instrument has become probably the most popular of any single method in vogue today, with the exception of the older procedure of dissection and snare.

It was felt by some, however, that a wire was preferable to a blade for the reason that a wire would follow the line of cleavage between the capsule of the tonsil and the aponeurosis of the muscles forming the sinus tonsillar with less danger of damage to surrounding structures. With this idea in mind Beck, in 1912, perfected his instrument by modifying the older Pierce Mueller snare, making it heavier and stronger and using it for the purpose of tonsillectomy without preliminary dissection by forcing the tonsil through the fenestrum and enucleating by means of the wire concealed in the Ved-Vedder tip which constitutes the terminal portion of the instrument.³

From this brief historical resume you will see why I am unable, in presenting a new instrument, to claim credit as a pioneer in the development of the tonsil operation. I have been antedated some hundreds of years. I have hoped, however, to succeed in developing an instrument that will be applicable in any case in which the Sluder or Beck instruments could be used and although I claim no originality for the main principles embodied in this instrument I do think that it applies these principles in a way that makes them best available to our purpose. I have taken it as fundamental that tonsillectomy may be best done, in the majority of cases, by the employment of the cold wire, coming from behind forward, slowly, and without preliminary dissection.

The instrument (Fig. 1) is modeled, in general, after the principle of the Mackenzie tonsillotome with the handle at an obtuse angle from the shaft. A wire is employed, No. 9 piano wire being used, by being threaded into the slide from the sides and pulled

down after threading until it fits into the grooves cut on either side of the trough of the instrument. The convexity of the wire loop is then pushed up through the throat of the instrument until it disappears in the groove of the fenestrum. The wires for this purpose should be cut approximately $5\frac{1}{2}$ inches in length as the instrument is so proportioned that when the slide is pushed up until the wire is in position a wire of this length brings the trigger to about the right distance from the handle. The slide should fit tightly enough in the trough of the instrument that it holds by friction after being pushed into position. If it does not it tends to slip back and allow the wire to escape from its proper place.

In performing the operation, no previous dissection is necessary. The instrument is held in the right hand for the right tonsil and in the left hand for the left tonsil. It is introduced exactly as if it were a tongue depressor and the fenestrum *carried* over beneath the lower pole of the tonsil to be enucleated and elevated until the lower pole enters the aperture. The instrument is then rotated through one quarter of a circle, until the remaining portion of the tonsil presents in the opening, and is dislocated anteriorly and slightly externally by a corresponding movement of the instrument. Although the tonsil will not now slip through the fenestrum without further assistance it is sharply outlined under the tense mucous membrane of the anterior pillar and it is usually not a difficult matter to force it through by means of judicious digital manipulation. Care must be used in this process not to injure the mucous membrane with the nail and to obviate this objection it is my practice to use the ball of the thumb for the purpose. It is sometimes quite difficult to persuade the gland to enter the fenestrum in its entirety and no description of technique can impart the necessary skill in this manipulation, but a moderate amount of experience will convince the operator that a very large majority of tonsils can be so mobilized as to permit of enucleation by this method. It is here that the personal equation of operative skill comes into play and experience is necessary to anything like uniform success in its application.

When the tonsil is found to be entirely through the fenestrum it is fixed in that position by pulling the wire down firmly with the first and second fingers on the trigger of the instrument. The shape and size of the instrument lends itself very nicely to this procedure. While pulling the wire down to grasp the tonsil it is important to be assured that the pressure of the finger or thumb holding the tonsil through the fenestrum shall not be relaxed and

it is well to push the gland as far through the opening as possible, even though putting the mucous membrane of the pillar under marked tension. Damage to it with the instrument is impossible. A careful inspection is now possible and if the tonsil is found to be only partly through the fenestrum it is feasible to free it by pushing back the slide, thus releasing it from the grasp of the wire.

If the tonsil is found to be in proper position, the operation is completed by turning down the threaded wheel, thus pulling the slide back and gradually tightening the wire until separation is complete. This can be done as slowly as desired and it is thought that a slow separation predisposes less to bleeding than a more rapid one.

As the tonsil separates from its surroundings it is possible to observe the edge of the anterior pillar as it retracts from contact with the throat of the instrument and it is advisable at this juncture to pull gently but steadily on the instrument to free the edges of the pillars from its grasp as they are separated by the wire. The tonsil will remain in the grasp of the instrument after removal as a few fibres of tissue are drawn into the throat of the instrument by the wire and hold it firmly, thus preventing it from dropping into the pharynx. If the wire is drawn too far into the throat of the instrument before removing it from the mouth the tonsil will be released from this grasp and the advantage of one very desirable feature of the instrument will be lost.

Before proceeding to the other side the slide is pushed back to its original position, carrying the wire into place as before. Rewiring is unnecessary, the same wire being available for several operations.

It is my belief that certain operations are best done by means of a preliminary dissection, especially under local anaesthesia, and it is not claimed that this instrument can be utilized for every case but it can be used for a very large percentage under general anaesthesia and with satisfaction in many cases under local anaesthesia.

The size of the fenestrum has been carefully worked out with the idea of making it universal and I believe it will be adaptable to a great majority of cases. It is 21 by 16 mm.

It may be of interest to enumerate briefly certain advantages that have seemed to me apparent in the use of this instrument:

1. Enucleation takes place with the minimum of damage to aponeurosis or mucous membrane. In fact I have found it impossible to do harm to the tissues with this instrument.
2. Introducing and removing wires is extremely easy of accomplishment.
3. Frequent wiring is unnecessary.
4. The shape of the instrument lends itself admirably to the mechanical needs of the method.
5. It can be used as a snare if removal of small pieces of tissue should be desirable.
6. The tonsil is retained in the grasp of the instrument after enucleation.

In conclusion, I wish to state unequivocally that I am not presenting a method of tonsillectomy but an instrument. To Dr. Greenfield Sluder belongs the credit for having presented and popularized the method of tonsillectomy without preliminary dissection, using one instrument for that purpose, and to Dr. Joseph Beck the further credit for having utilized the cold wire first, in accomplishing the same object.

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