

located. He further referred to some blood-pressure work done on his cases by Dr. John W. Boyce, which demonstrated that manipulation of the upper end of the œsophagus, as in bronchoscopy, was associated with profound shock. This should be forestalled. Further, he had found that general anæsthesia in abductor paralysis usually ended in a stabbing tracheotomy. In his opinion it was better to do a preliminary tracheotomy under local anæsthesia.

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## A DISCUSSION ON THE INDICATIONS FOR THE LIGATION OF THE INTERNAL JUGULAR VEIN IN OTITIC PYÆMIA.<sup>1</sup>

### INTRODUCTORY PAPER.

By HUGH E. JONES, M.R.C.S., L.R.C.P.,

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WHEN our President asked me to open this discussion, I accepted the invitation with very mixed feelings. While deeply grateful to you, sir, for the honour you conferred upon me, I was conscious of the difficulty of the task which that honour carried with it. When I thought of all the papers that had been written on the subject and the many great names associated with it, I found it difficult to imagine that my small experience could add to the general knowledge anything worthy of the occasion. The fact that you, sir, had recently read a most thoughtful and critical paper before the Otological Society of the United Kingdom—a paper in which you stated lucidly and temperately the case against ligation of the internal jugular vein—in one way added to my difficulties, but in another way had been a great help to me. To a certain extent and in one sense I have taken that paper as my text, or—shall I say—as the lesson for the day. It has been the habit of many writers almost to ignore the arguments advanced by Macewen, Brieger, and others against wholesale ligation of the vein, but however strongly one may adhere to the principles laid down by Zaufal, Horsley, and Ballance, the facts as marshalled in your paper compel our attention and your conclusions call for our careful consideration.

### SCOPE OF THE DISCUSSION.

In the great majority of cases otitic pyæmia (and I take the

<sup>1</sup> Communicated to the Section of Laryngology and Otology, at the Annual Meeting of the British Medical Association, held in Toronto, August, 1906.

expression to include septic intoxication and septicæmia of otitic origin) is caused by the infection of one or other of the sinuses grooving the temporal bone or of the bulb of the jugular vein, with or without preliminary occlusion by a thrombus; but a few cases of septicæmia and even pyæmia arise without evident involvement of the sinuses, or, as in a case I shall relate, without any indication of bone disease.

While, therefore, it is mainly with septic infection of the sinuses and internal jugular vein that this discussion is concerned, I trust that the exceptional cases referred to will also receive a share of attention. The title of the discussion leaves the exact meaning of "ligation" open. I doubt if anyone would think nowadays of tying the vein without at the same time dealing effectively with the disease in the temporal bone and lateral sinus, but there may be great difference of opinion as to the extent of the interference required and the order in which the various stages of the operation are to be taken. I think these questions may be said to come within the scope of the discussion.

The one thing certain which cannot be disputed is that the first essential in the treatment of otitic pyæmia is the rapid and complete eradication, so far as that is possible, of the primary focus in the temporal bone and of the secondary focus (if there is one) in the sinuses or vein, without at the same time accidentally causing a spread of the infection.

Even the surgeons who most object to wholesale "ligation" admit that cases do occur in which the secondary disease in the sinus and vein cannot be removed or its dissemination prevented without making ligation a part of the operation.

The questions we are asking ourselves to-day may be formulated as follows:

(1) Is ligation of the internal jugular vein in itself or in its consequences a dangerous operation, and if so, do its dangers ever outweigh those of leaving the vein untied?

(2) Under what circumstances and local conditions is it possible or impossible to determine whether the whole of the primary and secondary local foci can be removed and the further dissemination of the disease prevented without ligation of the vein?

(3) What method of procedure best overcomes the risks of the operation itself and of the disease?

(4) Under what conditions (if any) is it necessary or advisable to tie the vein before operating on the temporal bone and lateral sinus?

Before trying to answer these questions let us consider for a moment the comparative value of the evidence at our disposal.

(a) Anatomical and physiological facts are obviously of first-class importance. The whole plan of treatment is suggested as well as made necessary by the anatomical facts. Moreover, within the natural limits of variation the facts are constant and to be depended upon.

(b) Clinical evidence is not so satisfactory; it is not always easy to say at what precise moment or spot particular pathological changes occur; similar changes in widely-separated parts may produce similar general symptoms and give little or no local signs—for example, clotting in the various sinuses or veins, disintegration of the clot at various points, or mural extensions of the disease in different directions.

(c) This difficulty is overcome by operation in proportion to the completeness of the operation performed. Intervention limited to the lateral sinus leaves much room for speculation; the complete operation clears up many doubts.

(d) *Post-mortem* evidence is to some extent vitiated by changes which have occurred before operation, but will generally show whether the fatal extension took place backwards along the lateral sinus, downwards along the jugular vein, or along the collateral veins, or whether death was due to some coincident intra-cranial suppuration.

(e) Mere comparative statistics based on the results of operations with and without ligation are of little value, because the cases which are admitted by all to require ligation are those in which the disease was either of a much severer type or had been longer in existence before operation.

Reverting to my first question—(1) Is ligation in itself or in its consequences a dangerous operation? etc.—the objections which have been urged against the operation are:

(i) That ligation of the vein is positively dangerous on account of its interference with the collateral circulation—that is, with the escape of intra-cranial blood by the posterior condylar vein, the inferior petrosal sinus, and the facial anastomosis. It is undoubtedly the fact that one sinus is generally larger than the other, and it may be conceded that if the vein be tied low down on that side, when the opposite sinus is extremely small there is a danger of cerebral œdema. But how often does this extreme variation happen? Does it constitute a greater risk than, let us say, the possibility of a dangerous variation in the course of the carotid in

relation to the tonsil? Excision of the tonsil is rarely an urgent life-saving operation, but the possible risk mentioned is never allowed to interfere with that operation even when it is a matter of mere expediency.

(ii) That when the clot is limited to the lateral sinus, the posterior condylar vein and the inferior petrosal being supposed patent, ligation of the inferior jugular vein causes a flow of blood from the inferior petrosal sinus to the condylar vein, carrying with it septic material into the vertebral vein; furthermore, that under the above conditions aspiration of the bulb may take place through the agency of the vertebral vein.

It may be well at this point to consider, and if necessary to revise, our ideas of the anatomy of the lower end of the lateral sinus, the bulb, etc. The posterior condylar vein leaves the sinus at right angles, where the latter forms a semicircular recess before it becomes constricted and turns down through the jugular foramen. At the foramen the great vessel is compressed to its smallest dimensions. The opening into the bulb is almost valvular, and a slight downward pressure on the dura above or behind it is enough to close it. At this point, too, I have found two or three fine septa stretched across the opening like a grating.

It is probable, therefore, that clotting, whether it begins in the bulb or in the sinus, is stayed at this point for an appreciable time, and in many cases permanently arrested. Before clotting extends into the bulb the condylar vein will be occluded, and this probably occurs comparatively early in most cases of sinus thrombosis without the help of pathological or artificial occlusion of the vertebral jugular vein.

There is in some sinuses a constriction external to the jugular fossa. Exceptionally, the clotting may be stayed at this first constriction, in which case the posterior condylar would remain free a little longer.

These constrictions form a natural division of cases according to the place of primary infection. The barrier forms the lower limit for a time of the clotting arising from infection of the inferior petrosal sinus, the saccus endolymphaticus, the petrosquamosal vein, and the common form of infection of the sigmoid, and the upper limit of the clot in primary infection of the "bulb."

The inferior petrosal sinus does not open directly into the upper part of the bulb, as might be supposed from schematic drawings, but passes down obliquely through the anterior section of the

jugular foramen, separated from the greater vessel by the nerves (9, 10, 11), and joins the interior jugular vein at the lower margin of the bulb, or slightly lower by a slit-like and possibly valvular opening. Assuming that the blood is still fluid, or that the septic clot has become disintegrated, and that the sinus has been plugged, then ligation of the vein without resection or opening of its upper division would certainly cause stasis in the bulb, petrosal sinus, and in the condylar vein, but I cannot believe that a reverse current would be set up either in the direction of the vertebral, or towards the cavernous, sinus. Pulmonary aspiration of the sinus by the vertebral vein must be a difficult matter to demonstrate, and I confess to being sceptical on this point. That extension of the septic processes into the posterior condylar and the inferior petrosal often occurs has been proved by many *post-mortem* examinations in cases where no operation has been performed on the vein; so that there is no need to invoke reversal of the current or aspiration in explanation of the fact.

(iii) That the danger from the wound infection is serious. I have never seen serious infection from outside, but in a young child under my care suppuration took place in the track of the great vessels, apparently owing to infection from the divided end of the vein, which ultimately led to perforation of the trachea and septic pneumonia. An occurrence of that kind, however, only shows the extreme virulence of the poison which the operation was an attempt to combat.

These are the principal objections against tying the vein. Against them may be set the following considerations:

(a) If the lateral sinus is firmly closed down by a clot, the clotting in all probability extends to the posterior condylar vein; ligation then closes the larger avenue of two remaining ones and permits removing of the whole clot without serious risk.

(b) If there is a permeable infected lateral sinus or bulb, the extent of the mural infection is not ascertainable by operation on the sinus alone, and it is absolutely imperative that the clotting should be encouraged in the whole area in order that the disease may be dealt with radically.

(iv) The last objection—namely, that in many cases the operation is unnecessary, together with the second part of this question, “Do the dangers of tying the vein ever outweigh those of leaving it untied?”—may be left for consideration in the reply to the next question, namely:

Question (2): Under what circumstances and local conditions is

it possible or impossible to determine whether the whole of the primary and secondary local foci (when the latter exist) can be removed and the further dissemination of the disease prevented without ligation of the vein?

The best way of answering this question I think is to relate briefly some illustrative cases.

(1) The first is one of pyæmia without implication of the sinuses or veins. One of my own colleagues was the patient. The attack began with a sore throat, the soft palate being more particularly affected. The same night acute pain was felt in the right ear, and next morning a discharge of serum from that ear afforded some relief. The same evening, the pain having increased again, I was asked to puncture the membrana tympani. This I did without a general anæsthetic, the incision in consequence being a small one. For the next six days I was away from home. During that time the temperature varied from 99° to 101° F. On the fifth day of the illness three slight attacks of shivering (lasting three minutes each) occurred. On returning home I found my friend feverish, with dry tongue, severe earache, tympanic deafness, and pain over the right shoulder. Dr. Hill Abram saw him with me, and thought the shoulder pain was probably due to neuritis. On the twelfth day of the illness, the shoulder pain having grown worse, Mr. Thelwall Thomas examined the shoulder and decided to explore the right subdeltoid bursa; this was done, and about 5j of pus evacuated. This pus and the pus from the ear both yielded pure cultures of streptococcus. After this a rapid recovery followed. As the right ear continued to discharge a good deal of pus through a small opening, and the hearing showed no signs of recovering, I made, under chloroform, a very free incision along the posterior border of the membrana tympani. The discharge quickly ceased and the ear recovered its normal hearing.

This, then, was apparently a case in which the primary focus was superficial—that is, without bone disease—and in which no secondary local focus formed in the sinuses or vein. The systemic absorption appears to have been limited to a single dose, which quickly became fixed in one spot and was there destroyed without further dissemination. There was no evidence of mastoid disease or of sinus thrombosis. Events proved that so far as this case was concerned we were right in limiting the operations to the tympanic membrane and the opening of the single metastatic abscess.

(2) The following case belongs to another class: Girl, aged eight. Scarlet fever, acute suppurative otitis, apparent recovery. Two days after discharge from fever hospital swelling behind the ear, rigor; temperature, 104° F. Immediate operation revealed perisinus abscess. General symptoms were entirely arrested by drainage of the abscess. This was not, strictly speaking, a case of otitic pyæmia, but in all probability a few days' delay in operating would have caused acute septicæmia.

Take a third case:

(3) An attack of influenza with acute suppurative otitis in a girl aged fifteen was followed by mastoid empyema. On admission, large suboccipital, deep cervical

abscess. High temperature, and one or two rigors were known to have occurred. The subcortical mastoid abscess extended to the sigmoid groove. The anterior walls of the sinus at the knee were necrotic, and the clot within was beginning to break down. Free opening of the sinus, with wide removal of the infected portion of the clot, led to a complete recovery.

I am aware that it has been stated that there is no portion of such a clot which is not infected. If that is true, then blood-clot must have a high power of dealing with invading organisms. I have heard of one case such as this recovering without any operation, probably because the rapid destruction of tissue opened up a free communication between the interior of the sinus and the antrum.

A fourth case was not the result of an acute otitis, but as it began, under my own observation, as the result of a radical mastoid operation, may be regarded, for the moment, as an acute case :

(4) This was the case of a young man of twenty-one with caries of the floor of the tympanum. The radical mastoid operation was followed by primary infection of the bulb of the internal jugular. Exposure and incision of the sinus revealed no clot. The vein was then tied, and some time later a suppurating clot was washed out through its upper section.

Though this patient made a good recovery, I was guilty of a fault of technique to which I shall refer later. What I want to emphasise now is the urgent necessity for immediate ligation of the jugular in bulbar cases, whether primary or secondary. No such limitation of the infection as could be reasonably supposed to exist in the first three cases could be depended upon in the last one. Once the barrier at the end of the lateral sinus is passed, or if the infection takes place below that barrier, immediate ligation of the vein is called for. These are instances where information was obtainable at an early stage of the probable channel of infection and the probable extent of the secondary focus and the chances of its dissemination.

In the first three cases the risks of ligation exceeded those of non-interference with the vein. When we come to cases in which pyæmic symptoms have existed for four or five or more days, it is much more difficult to obtain the necessary information. Here time has been allowed for the extension along the wall of the sinus itself independently of the clot; the whole clot may have become infected, detached particles of septic clot may have re-attached themselves and established fresh foci in the veins beyond the limit of the original clot.

The photograph and specimen which I hand round will illustrate my meaning. In both these cases the extension was in the direction of and across the torcular—that is, against the stream. How much more likely is it for similar extensions to take place in the opposite direction and yet, as I remarked earlier in my paper, we have no certain guide to show us whether the extension is upward or downward. In the very last case in which I tied and excised the vein there was no cord in the neck, no tenderness along the sternomastoid, but very definite clinical signs of sinus pyæmia and a clot in the sinus were present. The vein, found with great difficulty, was tied and divided at the level of the lower border of the omohyoid. Though reduced to a mere string, its lumen contained a juicy fluid. It might be argued that this was a case in which, the vein being obliterated, its incision was superfluous. I do not think so. At any rate, before the vein was exposed we were in ignorance of its condition, and the symptoms all pointed to continued systemic infection. The patient made a rapid recovery.

My position is, therefore, briefly this, that owing to the comparative failure of the evidence obtained from clinical symptoms, local signs, and partial operations, in cases which have given evidence of pyæmia for one week, nothing short of the complete operation gives us the information we require or certain means of arresting the progress of the disease.

It must be admitted, however, that when the infection takes place high up in the sinus it may be possible to ascertain by operation on the sinus that a firm organising clot exists in its lower part, limited by the anatomical features described above, and if after removal of the disintegrating portion the drainage upwards along the lower part of the sinus appears to be quite satisfactory (I may remark, however, that drainage of the sigmoid is not easy, because the dura, pressed forward and downward by the cerebellum and brain, to a large extent closes the lumen of the sinus), and the systemic symptoms are arrested during the next forty-eight hours, we may assume that the whole of the secondary focus has been eradicated. If, however, there is progressive disintegration of the clot and faulty drainage of the lower part of the sigmoid, it becomes necessary, even without waiting for renewed symptoms, to excise the vein and establish thorough drainage.

The great value of tying and draining the jugular vein and bulb, from the point of view of giving us definite information and so simplifying a case, is shown in cases where recurrent suppuration takes place in the torcular end of the sinus. In a successful case



of my own suppuration occurred in the torcular end of the clot three weeks after the first operation on the vein and sinus and a fortnight after the evacuation of a temporo-sphenoidal abscess. The fact that the vein and the lower end of the sinus had already been efficiently treated was of great assistance in determining on the final operation.

(3) What method of procedure best overcomes the risk of the operation itself and of the disease? With certain exceptions the following is, in my opinion, the best method of procedure:

(a) Perform the complete post-aural operation.

(b) Expose the sinus until a healthy margin of at least half an inch is seen. Introduce a gauze plug between the sinus and bone at this point. Slit up the whole length of the exposed sinus and carefully inspect the clot. In a quite early case, with a probability of an uninfected thrombus in the lower part of the sinus, remove the disintegrating portion of the whole of the clot. If the sinus is found pervious, or the clot is probably breaking down through-out, expose the internal jugular vein, inspect it, tie in two places, below the apparently diseased portion, which may be considerably below the limit of the clot; dissect up the peripheral end, tying off the tributary veins, and bring the end out of the wound. Slit up the vein half an inch or an inch above the ligature. Unless the walls of the vein are much diseased, or there is suppuration along its course, the upper section of the vein need not be excised. Opening up the vein is imperative. I have once delayed this with the result described by Mr. Ballance of converting the vein into a bag of pus. No harm was done, fortunately, but the delay might have been fatal.

(c) Clear out the clot from the sinus and wash through the sinus, bulb, and vein from above downwards. The whole operation should be done, if possible, at one sitting. Washing through has been objected to on the score of risk of driving pus or infected clot into the inferior petrosal sinus. With an open vein this is practically impossible, as the anatomical arrangement of the sinus shows; and if it is not done, extension by continuity in the condylar vein and petrosal sinus will occur.

(d) I have not ventured to speak of the operation of exposure of the bulb, for the simple reason that I have no practical experience of it. I have not been able to persuade myself that it was required.

(4) Under what condition, if any, is it necessary or advisable to tie the vein before operating on the temporal bone and lateral sinus?

(a) Whenever it can be demonstrated, or it is even suspected, that there is or has been a clot in the internal jugular vein or its bulb.

(b) When there is extensive disease of the temporal bone in the immediate vicinity of the bulb, and a radical operation has been decided on.

In these cases, in my opinion, the ligation of the vein should precede any further operation, but should be immediately followed by the obliteration of the sinus.

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#### INTRODUCTORY PAPER.

BY JAMES F. MCKERNON, M.D.,  
New York.

A CLOSER study of the symptomatology of the various sequelæ of otitic disease, both acute and chronic, during the past five years has enabled us to more quickly and accurately diagnosticate sinus, bulb, and jugular involvement than formerly, hence our method of procedure in dealing with one or more of these complications differs materially from the treatment formerly in vogue.

In speaking of the indications for the ligation of the internal jugular vein, I shall confine myself briefly to my own personal experience when called upon to treat this sequelæ of otitic disease.

At the beginning let me say that there are but a small number of cases which when first seen present a set of symptoms sufficient in themselves to admit of a prompt diagnosis of vein involvement, and then only in cases of long standing, when a sufficient time has elapsed for an extension of the process from the sinus and bulb to the vein below.

The large majority of sinus cases are not present, or if so, are not recognised, at the time the primary mastoid or radical operation is done. The classical symptoms which enable us to recognise and properly care for these cases develop from a few hours to several days later, so that the majority of sinus and vein operations that are done are subsequent to a primary operation.

The rule which I have followed in this work has been that when we open the sinus for exploratory purposes, and find either pus or a disintegrated clot, or both, present, to stop further manipulation above so as not to disseminate any more poison from the local focus into the general system, and immediately expose, ligate and resect the internal jugular vein from its exit at the skull to a

point just above the clavicle, at the same time removing all infected glands encountered during the course of the dissection. When this has been done, the sinus and bulb are then evacuated of their contents, and I have but seldom found it necessary to remove the lateral wall of the foramen. If, when the sinus is first opened, a firm parietal clot is exposed and removed, and a free hæmorrhage takes place from both distal and proximal ends, I have not considered it necessary to molest the vein, although in a few cases I have subsequently been obliged to remove the vein owing to the continuance of the symptoms for which the sinus operation was done; so that each year, as our knowledge of this disease becomes more positive, I am more and more convinced of the necessity of primary jugular ligation where cases present themselves with definite sinus symptoms,<sup>1</sup> even though evidence of vein involvement be negative. I know that exception to this will be taken by many, but the statement is made only after a faithful trial of both methods, which has left me, for the sake of the future of my patients, unqualifiedly in favour of a primary ligation of the jugular vein.

A point referred to by many observers in treating thrombus of the sinus is that when a free return flow of blood takes place from the bulbous portion of the sinus, it is a positive indication that there is no obstruction below. With such a statement I must take issue, for in eight cases where I did a primary ligation of the internal jugular vein as a first step in the treatment of sigmoid sinus thrombosis, and immediately afterward exposed and evacuated a disintegrated clot from both sinus and bulb, such evacuation was at once followed by a free and, if allowed, prolonged hæmorrhage in each case, showing distinctly that such return flow does not come to any extent from the vein below, but has its source in the inferior petrosal sinus. So I believe it is extremely unwise to depend upon such a return flow from the bulb as an indication that the vein below is carrying on its usual function. Even though it were carrying on its function, if the case be a very septic one, and the vein be removed and its walls examined, septic micro-organisms will be found embedded throughout, and it is from just such a condition as this that I believe many subsequent infections develop, even after all the septic materials have been removed above.

In a number of cases of thrombosis in young children, when the site of the obstruction was at the bulb, I have not ligated the vein

<sup>1</sup> By definite symptoms I refer to a chill, and the wide excursions of temperature which are usually present in typical cases.

for the reason that they were seen and operated upon early, and also because young children, in my experience, do not bear prolonged operations well. In some of these cases I have had to do a subsequent ligation, but did it at a time when the temperature was on a decline, believing that these patients react better when operated upon with a low temperature than when it is high, as it puts less strain upon an already weakened system, and there is less depression following.

In closing, just a word about the neck wound after ligation and excision of the vein. I have usually closed it by suturing, except for a small space at the upper angle, but before closing insert a large cigarette drain the entire length of the wound. The parts are dressed with gauze soaked in a hot saline solution, and this dressing is changed every twenty-four hours, and each time it is dressed about an inch of drain removed, so that at the end of five or six days the neck wound is completely healed and the drain removed.

#### DISCUSSION.

Dr. MACCUE<sup>N</sup> SMITH strongly commended early operation.

Dr. GEORGE A. LELAND (Boston) said the opening papers by Mr. Jones and Dr. McKernon had been so exhaustive that he hesitated to add anything. He fully agreed that ligation and resection of the internal jugular was necessary in a large number of cases when it was perfectly evident that the pyæmia present—whether of shorter or longer duration—was of otitic origin, and when, after ablation of the carious mastoid process, extensive involvement of the sinus was found. This held good especially when the infection was rapid and virulent, as sometimes observed in cases of the exanthemata, or in extensive pneumococcal or influenzal infections in which they could not operate too quickly. There was, however, another large class of cases in which the process was milder, and in which they could have more time. In these, after removal of all the diseased tissue in sight, including the whole mastoid process and the outer wall and contents of the sinus even down into the bulb, they could by modern methods tell exactly what was going on. For, by determining the degree of leucocytosis, and especially the relative proportion of the polynuclears, they would know if pus-absorption were still proceeding, and could act accordingly. Thus, it had been his good fortune during the past few years to see the ante-operative pyæmia disappear, sometimes rapidly, sometimes gradually, after removal of all accessible diseased tissue, showing that the bactericidal power of the blood was worthy of being trusted. Or it might be a case of osteophlebitis, and the pyæmic symptoms might be caused by absorption of toxins. In this event it was satisfactory not to be obliged to subject the patient to the operation in question, and so to make possible the circulatory disturbances which certainly had in some instances followed the obliteration of this large venous channel.

Dr. W. SOHIER BRYANT said that ligation of the vein should precede section or incision of the sinus. The indications could be divided into: (1) General: a febrile temperature with wide fluctuations or metastatic

foci of infection; (2) local: (a) necrosis of the wall of the sinus or bulb; (b) suppuration of the wall of the sinus or bulb without active growth of granulations. He did not consider the presence of a thrombus an indication for the ligation of the vein in the absence of all the other conditions mentioned.

Dr. J. A. STUCKY (Lexington, Kentucky) mentioned one point of sufficient importance, he thought, to be emphasised, especially in the after-treatment of the case—namely, the daily blood count. Not only the number of leucocytes, but the percentage of polynuclear cells should be taken into account. These indicated the condition of body resistance, and afforded evidence of septic absorption.

The PRESIDENT was greatly impressed by Dr. McKernon's arguments in favour of frequent ligation. In the presence of certain evidence of thrombosis of the bulb he had no hesitation in ligaturing at once, as in a case of bulbar pyæmia and cerebellar abscess which he published lately in detail.<sup>1</sup> Further, if a clot were felt in the jugular vein, and especially if softening, there was no room for doubt. He was convinced, however, that there were many cases of thrombus of the sigmoid sinus with breaking down in the middle in which it was sufficient (after removing the original focus in the petrous bone) to clear out the broken-down part, leaving a plug of healthy clot on the proximal side. He drew attention to Macewen's remarkable series of recoveries without ligation, but ventured to think that such a continuance of good results was not likely to be maintained with recourse to this proceeding. He was still in doubt as to the indications for ligation in the cases subsequent to acute suppurative otitis, especially in view of such histories as those narrated by Mr. Hugh Jones. The repeated examination of the blood and observations of the course of the symptoms were important helps. He felt that the last word had not yet been said on the subject.

#### REPLY.

Dr. McKERNON, in closing the discussion, said that to the question. Was ligation of the vein dangerous? he would answer, No, provided the patient's strength be good. The danger of ligation did not outweigh the advantage of its being left alone, for infection might take place. The nature of the infection had no bearing upon whether they should or should not operate. The reason cases recovered without ligation was not because the entire focus had been removed, but because the resistance of the system was sufficient to eliminate the poison. If clot were removed and the vein left untouched how were they to know that infection was not going to continue? They did not know, but had to wait, and this waiting might be too long for their patient's safety. He believed it was wiser to ligate at once than to wait several days and then ligate when it was too late to save their patient. Rapidity had much to do with the success of their operations. He thought, as Dr. Leland had said, that the differential blood count was very valuable, both before operation, as an aid in diagnosis, and later as an indication as to whether the poison had been eliminated or was increasing. He used the count in all cases. In reply to Dr. Stucky, he might state that the cigarette drain was simply a piece of plain sterilised gauze rolled firmly, as long as the little finger, covered with perforated rubber tissue, and placed the entire length of the wound.

<sup>1</sup> JOURN. OF LARYNGOL., RHINOL., AND OTOL., vol. xxi, p. 113, March, 1906; *Lancet*, April 14, 1906.

the ends protruding from the angles of the wound. Dr. Dundas Grant's method of clearing out a disintegrated clot, with or without pus in the sinus, he believed to be unwise, for the coats of the sinus were impregnated with the micro-organisms, and subsequently a further infection would occur if the operation were stopped at that point. Dr. Jones had made the duration of the disease an indication for ligation; he thought that its virulence should also be considered.

### Abstracts.

#### ACCESSORY SINUSES.

**Capart, A., jnr.** (Brussels).—*The indications for operation in the treatment of Sinusitis.* "La Presse Oto-Laryngologique Belge," February, 1906.

Three questions are here discussed, namely, the relative frequency of intra-cranial complications in affections of the sinuses; the dangers of certain operations; and the prognosis of intra-cranial complications. The author concludes that although dangerous complications may supervene, yet, considering the great frequency of cases of sinusitis, we must regard these dangerous sequelæ as very rare. Moreover, as many published cases show that radical operations are not without serious risk, a degree of prudence is advisable in recommending operation, especially in cases where the patient's symptoms are not in proportion with the pain and risk entailed by operative treatment. When a serious complication has occurred it is the absolute duty of the surgeon to operate, although, from the small number of successful cases on record, the issue may be considered extremely doubtful.

*Chichele Nourse.*

#### LARYNX.

**Paterson, D. R.** (Cardiff).—*The Operative Treatment of Laryngeal Papillomata in Children.* "The Lancet," July 21, 1906.

The author, in this short paper, draws attention to the advantages of the direct endo-laryngeal method. After reviewing the various operative measures in vogue for the removal of laryngeal papillomata in children, he proceeds to describe the method by which, in his experience, the larynx can be most easily brought under direct inspection, and the endo-laryngeal procedure greatly simplified.

The instruments required for the removal of papillomata by the direct method are a fish-tail tube spatula, with handle attached and a straight forceps. For illumination he recommends the Kirstein electric head lamp. The operating table should be of sufficient height to enable the operator, when seated on a low chair, to work conveniently. The patient should be placed on the back with the head hanging over the end of the table and a low pillow under the shoulders. Chloroform is the most suitable anæsthetic to administer, and full anæsthesia can be kept up from a Junker's inhaler. The pharynx is brushed lightly with a 10 per cent. solution of cocaine, the tube spatula is introduced, and through it the entrance of the larynx and the under-surface of the epiglottis are similarly brushed. In the introduction of the spatula its point is passed along the under-surface of the epiglottis and then tilted upwards, so that it carries that structure forwards and enables an admirable view of the larynx to be obtained. In the majority of cases even this is not necessary.