SOCIETIES' PROCEEDINGS

ROYAL SOCIETY OF MEDICINE—SECTION OF OTOLOGY

President—JOHN F. O'MALLEY, F.R.C.S.

November 4th, 1932

Discussion on the Treatment of Lateral Sinus Thrombosis*

By E. A. PETERS (London)

THE sigmoid sinus, jugular bulb, and the superior and inferior petrosal sinuses form a triangle which drains the blood from the petrous bone. As the result of mastoid sepsis small vessels may thrombose and the clot extend to the sinus and its connections, producing fatal diffluent thrombosis or, on the other hand, the organisms from the zone—usually hæmolytic streptococci—may enter the bloodstream, causing a bacteræmia, or later a septicæmia. In addition, there is the mural or parietal clot owing to the sinus being surrounded by infected bone or perisinus abscess under pressure. Thrombosis due to endothelial inflammation from within presents a more chronic form. The sinus wall, though sensitive to acute inflammation, is very resistant to chronic inflammation, the flowing blood dealing effectively with a mild degree of infection.

(CASE I.) Two months ago I operated on a semi-comatose man with slight œdema of the right disc: right side extensive polypi; fibrous granulations attached to lateral sinus. Needle puncture, blood fluid, containing no micro-organisms. On the left side cholesteatoma; fibrous granulations of the dura mater; fatal temporo-sphenoidal abscess.

Bacteræmia from venous and lymphatic absorption is more common than diffluent thrombosis.

(CASE II.) A child with discharge from both ears and temperature swinging between normal and 103°, was found to have slight facial paralysis on one side. The affected mastoid was evacuated; blood containing hæmolytic streptococci. Anti-scarlet fever serum given. Recovery.

The problem as to why the same organism causes thrombosis in one patient, and in another a bacteræmia, is unsolved. It is

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vaguely alluded to by such expressions as virulence of the micro-organism, and resistance of the individual.

The common post-operative thrombosis of general surgery presents the opportunity for prophylactic treatment, but this does not occur in the acute cases under consideration. In aural cases early incision of the membrana tympani, eradication of septic focus, and treatment by serum form our mainstay.

In this country Arbuthnot Lane, in 1888, was the first to open the sigmoid sinus, which he emptied till he came to healthy clot; he then ligatured the internal jugular vein. The patient—a child—recovered.

The next impetus was to remove all the clot till the sinus bled and this led to extensive resection of the internal jugular and deep facial veins. Grunert was the first to deal drastically with the jugular bulb. Dan McKenzie has shown that the jugular bulb cannot be evacuated from above. It is possible, however, to evacuate or pack it from below after resecting the internal jugular vein.

Lake used to pack off the sinus from outside to restrict the flow of blood from the infected area. Hunter Tod made a practice of tying the jugular vein in order to prevent distribution of the organisms when marked fever or rigor followed a mastoid operation. Such cases of bacteræmia would nowadays be treated with serum.

The variations of treatment employed are due to the fact that we are treating an infection which at one end of the scale includes extensive thrombosis and at the other end, septicæmia without thrombosis. Dan McKenzie describes the widespread thrombosis in many of the cerebral sinuses commensurate with an endless shower of emboli. In an intermediate class comes mural clotting of local character from which the patient may recover even without surgical interference.

The mastoid area readily becomes infected with the *Streptococcus hæmolyticus* constituting the focus of infection.

(Case III.) J.P., aged 9, seven days' history of bilateral aural discharge.

Condition on admission.—10.10.32. No discharge in the ear; temperature 103°; paracentesis of right drum; pus.

11.10.32. Paracentesis of injected left drum, no pus. Rigor, Babinsky positive.

12.10.32. Lumbar puncture, cerebrospinal fluid under pressure, cells 7 per c.mm., 70 per cent polymorphs.

13.11.32. Temperature fell to normal, Babinsky negative, both ears discharging, blood contained hæmolytic streptococci. Intravenous and intramuscular injection of anti-scarlet fever serum up to 90 c.cm. per day commenced 12.10.32.

Subsequent periarticular effusions around knee and shoulder; incision, clear fluid came away. Swinging temperature for 10 days. Recovery.

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In this case there was no thrombosis, but the infecting organism passed from the middle ear to the meninges, and caused septicæmia.

Treatment.—The first and most important step in treatment is the eradication of the septic osteitis. The areas which should be especially examined are :—

(*a*) Those in relation with the wall of the sinus, sub-group No. 1, cells along the transverse limb of the sinus ; 2, cells, deep and central, of the mastoid process, even to the opening of a deep cell in the occipital bone ; 3, cells anterior to the sigmoid sinus and below the semi-circular canals. This area is in close relation with the cerebellar dura mater.

(*b*) The other more rarely affected areas :—

1. The spongy bone superior to the semi-circular canals. It is probably an extension from this region which produces lepto-meningitis with abducens paresis.

(Case IV.) A child exhibited meningeal signs : abducens paresis with mastoiditis. The mastoid was evacuated and the dura over the roof of the tympanum incised. A meningeal collection of clear fluid was drained. Packing was pushed forward between the dura and the bone for half an inch. Recovery.

2. The zygomatic cell area.

3. Cells stretching back along the horizontal limb of the lateral sinus.

(Case V.) A man with a discharge in the ear presented a considerable swelling which reached anteriorly one inch from the auricle. Exploration indicated thrombosis of the horizontal sinus, due to a long gallery extending from an infected mastoid. The vein was incised and packed with bipp gauze. Recovery.

In cases of lateral sinus thrombosis, Mygind evacuates the areas of bone only, and reports recoveries increased from 55 to 71 per cent ; he avoids carrying out even an exploratory puncture of the vein.

The next important step is to expose the dura mater and lateral sinus in all cases of acute mastoiditis. Discolouration of the transparent blue wall or lack of pulsation, or the presence of clinical signs, call for needle puncture, after mopping out the cavity with hydrogen peroxide lotion. If clotting is evident the vein is incised and a bipp plug passed down to the bulb and up to the superior petrosal sinus. The plugging should not be too tight ; it limits infection from the diseased area and prevents bleeding. I do not remove the blood-clot with a view to obtaining a flow of blood, but rely upon the formation of a protective wall of healthy clot.

In the chronic mural cases the central part of the clot breaks down into an abscess which ulcerates through the walls of the vein. Incision of the abscess and drainage result in healing.

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In cases of extensive clotting, the clot may extend down the internal jugular, as is shown by swelling and tenderness along the vein and a chain of swollen lymphatic glands. The veins in such a case should be exposed and excised.

In early cases of thrombosis of the lateral sinus the internal jugular vein is empty and collapsed and has the appearance of a white goose quill; MacEwan tied the vein only if the thrombus in the lateral sinus extended beyond his incision. Alexander divided the vein, ligaturing the proximal and bringing the peripheral out through the skin incision. I have employed this method, closing the end with a clamp. I did not observe any discharge when the vein was unclamped. It is doubtful if ligature of the collapsed vein is of value. I do not advise syringing from the internal jugular below or the lateral sinus above. I saw half a pint of fluid syringed on one occasion from below but none appeared in the lateral sinus wound. Most of the fluid must have passed along the inferior petrosal sinus.

With the object of limiting infection along the inferior petrosal, I have packed gauze between the bone and the dura mater exposed by clearing away the cells anterior to the sigmoid sinus. It is dangerous to obliterate both lateral sinuses.

These points, I would suggest, underlie the treatment of sinus thrombosis and the inseparable bacteræmia. They comprise a method of eradicating the source of infection and institute a partial venous isolation of the petrous bone. Isolation of the lymphatic side can be obtained by inserting gauze where possible between the infected bone and dura mater. This isolation may be carried to an extreme, when an infected labyrinth endangers the meninges, in separating the auditory and facial nerves from the internal auditory meatus by the insertion of gauze and dissector between the bone and dura mater anterior to the sigmoid sinus after removal of the sub-labyrinthine cells.

Discussion.

The President said that, with regard to the question of ligation of the vein, when he was first interested in the subject, the textbooks never failed to emphasise tenderness or swelling over the jugular vein as signs to be looked for, but it was his experience that if a case had gone so far as that, the patient's dissolution was not far off. It would be well if, in future textbooks, this was not given as one of the classical symptoms to be expected. The *pros* and *cons* of ligation had been put before this meeting in full. Mr. Peters seemed to regard the procedure as seldom necessary, while Mr. Wilson made out a case for it in certain circumstances and instances, as when the clot lay very low in the lateral sinus. He himself agreed with the latter view, because a clot in that situation

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might not drain very well through the open sinus, and if it disintegrated there would be a distribution of the material and a general infection.

There was, however, an aspect of the question before the surgeon was called in to diagnose the presence of a thrombus, and to deal with a thrombosis of the lateral sinus, namely, the symptomatology of the early infection. That was important from the fact that cases which had been regarded as too severe to recover had yet done so, while in others, patients who seemed to have a chance of recovery died. Some information could be derived from the antecedent symptomatology. He visualised two kinds of processes going on : (1) Infection from the focus in the mastoid spreading into the lateral sinus and setting up a systemic infection, which might be toxins only ; (2) the graver type, in which not only was toxæmia present, but probably bacteria were distributed throughout the body. In the first type one's procedure, whatever it was, was more likely to be successful than in the second form.

DR. DAN MCKENZIE said that some years ago he contributed to the Section a paper in which he gave the principles of diagnosis and treatment of thrombosis of the jugular bulb.*

The cases in which the jugular bulb operation could be carried out were very few, but to say it was unnecessary was flying in the face of fact ; he could not allow such a statement to pass unchallenged. With regard to ligature of the jugular vein, he suggested that if there was no clot below, tying should be done above the junction of the deep facial vein, then one only cut off the circulation from the seat of the disease. Tying of the facial vein might interfere to some extent with the circulation through the cavernous sinus, and so favour cavernous sinus thrombosis.

It was impossible to say whether ligation of the vein was good or bad. If the case was a grave one and there was much clot, probably most operators would tie the vein. But those were the cases in which the patients died. If, however, the clot was localised to the mastoid region, most operators would probably not tie the jugular vein. But such cases would in any case tend to recover. As he had said in his earlier paper, he still thought that tying the jugular might facilitate the cure of the case, because in a few days the ligature came off, and drainage probably occurred along the vein. Thus the ligature question was a very difficult matter to settle. Indeed, he did not know how it could be settled except by tying the vein in every instance in a long series of cases, and omitting it in every one of an equally long series and then comparing the two. It was noteworthy that the recovery-rate after operation was at present about sixty per cent, as shown by the statistics of expert operators.

SIR JAMES DUNDAS-GRANT said he had been influenced by the teaching of Sir William MacEwan, who obtained a succession of good results without ligaturing the internal jugular vein, but he was convinced that Sir William would have been obliged to ligature the vessel in later cases. He, the speaker, had misgivings about ligaturing the vein, in

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view of the reversal of circulation which caused back pressure on the cavernous sinus, and possibly even on the tributary veins from the cerebellum, possibly accounting for the formation of cerebellar abscess, as in a case shown by Mr. Bull to the Otological Society. Septic material could be carried into the deep prevertebral veins and death ensue in spite of the ligation of the jugular. Mr. E. B. Waggett had reported a case in which fatal embolism occurred a few days after ligation. He (Sir James) urged that the exposure, exploration and cleansing of the sigmoid sinus was the primary element, careful observation being kept up and prompt intervention (by ligature, etc.) carried out if the symptoms did not subside. When the vein was divided it was of the utmost importance that the lower end of the upper segment should be brought to the surface for drainage purposes and not simply tied and left in the wound. He had seen a patient in great danger until such a tied stump burst and the pus escaped.

If the anterior end of the sigmoid sinus was blocked and the clot was a healthy one, the desired end was probably obtained. It was often possible to tell whether this had taken place by putting a finger on the exposed sinus and gently pressing on the unexposed internal jugular vein, when fluctuation could be elicited if there was no thrombosis.

While holding the view that ligation of the jugular should not be a routine practice, he had, of course, had a number of cases in which he had carried it out, and he proposed to bring before the Section, at the next meeting, one of these cases, complicated by a cerebellar abscess. With concentration of attention on the sigmoid sinus, careful observation, and prompt further intervention, very good results could be obtained. Sixty per cent was not too high a computation.

Mr. T. B. Layton said he heartily agreed with Mr. Peters and with Mr. Wilson that the most important point in the treatment of this condition was the complete removal of the septic focus in the bone overlying the sinus, but in all else he disagreed entirely, owing to their approach to the subject.

The otologist's attitude to-day should be not that thrombosis was a pathological condition, but that it was a physiological process whereby nature tried to prevent an invasion of the blood-stream from the overlying osteitis; they should look upon a rigor, not as an evidence of a thrombosis occurring within the lateral sinus, but as evidence of a sudden access to the blood-stream of a large number of organisms. Such access might occur through any venous channel; and what they had to fear was this invasion, not the act of clotting in the lateral sinus which, indeed, was the most important vessel, merely because it was the largest and nearest. The clot in this vessel was a protection and should be left alone unless the clot itself was breaking down into pus and thus becoming the source from which the invading organisms entered the blood-stream.

Invasion might be most marked where there was the least change in the dura mater overlying the sinus. The most intense symptoms with high temperature might be present and yet all that was seen might be a little roughening over the dura, so slight that it was hard to

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tell whether it was pathological or due to the slight trauma from the first mopping of this surface with a surgical sponge. Though he had never done it deliberately, he did not think it would be bad treatment to incise the dura at this stage to allow of bleeding and so compel a clot to form to prevent further absorption through the damaged dura.

In the next stage the reactions of the body had come into play, and these appeared on and in the sinus in the form of: (1) granulations, and (2) clotting in the vein. The granulations prevented absorption until they themselves had become septic and were breaking down. Before they had done so one could not say without inserting a needle or making a stab incision whether there was a thrombus and if so whether the clot was a mural or a complete one. But in any case it should be left alone, and to make a stab culture into a healthy thrombus across an infected dura mater was a bad thing.

At the next stage, in which the granulations were beginning to break down and to suppurate, it was difficult to decide whether to incise the wall. In most cases it was probably safer and therefore better to leave it; but if the fibrous wall were damaged it might necrose and thus allow secondary hæmorrhage to occur. Perhaps because he incised the dura less often than many, he had seen five cases of secondary hæmorrhage from the lateral sinus. In each case it had been stopped easily, but the event was alarming and therefore undesirable.

By the time that the fibrous wall was damaged, clotting beneath was sure to have occurred, and for a time the symptoms might diminish until this clot itself had broken down into pus. When the latter had occurred was the time when incision was necessary; and, if possible, the advice of Lane quoted by Mr. Peters should be taken.* He remembered a child in whom œdema of the dura had been the indication for opening the sinus, from which he had removed a grey-coloured clot until at either end he had come on to healthy plum-coloured clot, and the child was so ill that he did not think he would have recovered from the added loss of blood.

He thought this last type of case was rare to-day, and that Mr. Peters was trying to impose upon the younger otologists a line of treatment which was useful for the cases seen in " the nineties ", but which had almost disappeared.

Turning to the operation to be performed, he thought again the opening speakers had a wrong approach. It was not an anatomical one that was needed whereby bone was removed for a given distance in either direction along the lateral sinus, but they needed a pathological approach and must remove bone until a healthy area of dura mater could be seen all round the area of granulations covering this structure.

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* Later in the discussion Mr. Holt Diggle spoke kindly of the speaker's description of the appearances found; but asked how these might be diagnosed. The answer is that they cannot. All that can be diagnosed is the absorption of organisms with the blood-stream. On this the decision is made to open the mastoid and to explore the fossa over the lateral sinus. The speaker was discussing the conditions that might then be found.

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He would have liked to discuss the question of ligature of the jugular vein, but felt that he had taken enough of the time of the Section.

Mr. STUART-LOW said he wished to emphasise that there was a period following the mastoid operation during which careful observation ought to be made and certain treatment applied, as this often obviated development of sepsis in the jugular vein and lateral sinus. During this period ointment, collargol or collosol collargol, should be freely applied to the whole side of the region of the neck, over the vein, and around and beyond the vein. Collargol was a powerful germicide and antiseptic, and was quickly absorbed under such conditions. It should not be rubbed in, but laid on, as anything in the way of friction might disturb the septic clot. This application should be repeated every three hours, and layers of cotton-wool laid on the neck, and over this a gutta-percha splint extending from the head to the clavicle put on while warm and moulded over the whole. Thus the neck was maintained in a rigid position and so rest of the parts was secured.

He administered drachm doses of the old Edinburgh tincture of iron with three grain doses of quinine every three hours.

He looked upon the condition as an erysipelas, the same organism, streptococcus, being present in most cases. He had recently had a case in which, after a mastoid operation, a swinging temperature up to 105° with rigors had resulted, and with this treatment the patient made a good recovery without any surgical interference with vein or sinus. He stressed the value of utilising these methods before finally deciding on tying the vein.

Mr. NORMAN PATTERSON asked whether members, when faced with a case of bilateral ear suppuration, applied tests to ascertain which was the ear responsible. In one of his cases he operated upon the wrong ear, and it was necessary subsequently to deal with the other. Both ears were discharging, and the temperature was 104° F. The temperature was normal next day, but next evening it rose to 105°. He found on operating on the other ear that that was the one responsible; in the first ear nothing was found to explain the symptoms.

He questioned the phrase used by Mr. Peters, "resection of the lateral sinus." How was that accomplished? He did not see how one could resect the lateral sinus without causing meningitis. "Partial resection" might be a justifiable term.

Mr. SYDNEY SCOTT said that he had, to his surprise, recently been asked: "Is it not dangerous to turn out the clot in lateral sinus thrombosis?" In his experience it was the right thing to do, as Sir Arbuthnot Lane and Sir Charles Ballance had shown long ago. He agreed with Mr. Layton that primarily the formation of the thrombus was a means of protecting the system from "generalised" infection, and did this so long as the clot itself remained the seat of a localised abscess. He took care to remove the whole of the clot, and to excise the outer wall of that part of the sinus from which the clot was removed. To detach the clot a small curette was sometimes essential; they used motor-suction as well.

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He found Queckenstedt's test of great value in diagnosis in certain cases, and had always regarded the needle as a useless means of exploring the lateral sinus.

It was often difficult to identify the internal jugular vein in cases of lateral sinus thrombosis, especially when the vessels were obscured by numerous glands, and the internal jugular was contracted and empty. The key was generally the common facial vein.

He had never felt the thrombus as a cord in the neck, as they used to be taught to expect. Any similar swelling turned out to be the chain of enlarged lymphatic glands along the carotid vessels (q.s.), but they sometimes found a large fluctuating swelling due to an abscess; after freely opening such an abscess, ulceration and destruction of the walls of the internal jugular vein could be identified.

Though it might be supposed that it was dangerous to close the wound after opening the lateral sinus, he was accustomed to close it by sutures, leaving a pleated " bipped " dressing of gauze or cotton wicks emerging between the sutures. The dressing was gradually withdrawn, but not completely until the seventh or eighth day. The mortality had fallen, because the operation took place early, more frequently than was formerly the case.

Mr. THACKER NEVILLE said that the great point in regard to this condition was its prevention. When paracentesis was performed a culture of the pus should be made at the same time, and if a *Streptococcus hæmolyticus* was grown the lateral sinus should be opened and the internal jugular vein tied at an earlier date than in milder infections.

At the Conference in Madrid, Amaño had read a paper urging the prophylactic measures of intravenous and intramuscular administration of antipneumococcal sera and scarlet-fever antitoxins to prevent meningitis. This would necessitate a bacteriological examination being made at the time of operation, be it a mastoid or a paracentesis.

A record which no member of the Section should overlook was that published by the Medical Research Council in a Blue Book on the effect of the arsenic preparations in hæmolytic streptococcal infections. It showed the bactericidal effect of metarsenobillon given six-hourly in 0·3 gm. doses on hæmolytic streptococci and pneumococci. Novarsenobillon was condemned on account of its toxicity for leucocytes. If in the course of a run of normal temperatures (in the case of a hæmolytic streptococcal infected mastoid) the temperature one night suddenly rose to 104°, he opened the sinus at once and tied the vein in the neck.

Operation should be performed when septic absorption occurred, when probably a mural clot was present, i.e., long before complete clotting of the sinus took place. Recently there had been in his hospital a case in which *Streptococcus hæmolyticus* was found and the temperature pointed to the lateral sinus operation, but finally a wide exposure of meninges had to be made before the temperature became normal.

Dr. Miller, of Harrogate, inoculated a patient with this streptococcus and thus rendered his blood ready for transfusion, his intention being to carry out a transfusion if septicæmia continued in spite of opening the lateral sinus and ligaturing the vein.

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Royal Society of Medicine

Dr. DOUGLAS GUTHRIE said he wished to allude to primary thrombosis of the jugular bulb, a condition not uncommon in children and often mistaken in its early stages for aural septicæmia. The bulb became directly infected through the floor of the tympanum and the thrombosis extended in both directions. Jugular ligature was often necessary if the bulb was to be drained effectively.

With regard to early diagnosis of thrombosis of the lateral sinus, it should be emphasised that mastoid tenderness in such cases was the exception rather than the rule, and that the rigor was by no means a constant symptom. In the last ten cases of sinus thrombosis which he had treated only two had shown mastoid tenderness.

Mr. HOLT DIGGLE said that, after hearing Mr. Layton's pathological classification, it would be valuable to know how one was to decide clinically as to the type of case with which one was confronted.

With regard to treatment, admittedly the late cases were the most difficult to deal with, so that to produce better figures became a matter of early diagnosis. Nowadays fewer veins were tied than formerly, owing to the recent treatment by sera and other synthetic bactericides. There were cases with rigors and shivering which responded well to injections of serum, and such preparations as s.u.p. 36.

Mr. Peters had raised the question of exposing the dura and sinus in all acute cases in which the temperature was 101° F. or more. He (Mr. Diggle) joined issue with that remark unless other and more certain signs were also present.

One of the earliest symptoms he had noted was pain at the back of the neck, with some torticollis. That was frequent in extra-dural abscess in the posterior cerebellar fossa. In the presence of pain and stiffness of the neck he would expose the lateral sinus at the first operation.

The question of ligating both lateral sinuses was very important. One might meet with a case of double otitis and infection, perhaps on both sides, with a thrombus in each lateral sinus. An interval of two or three weeks was not sufficient time for the circulation to be re-established after ligating one jugular vein, and the prognosis was very doubtful. It was safer at the end of six weeks. He thought patients should be warned that they had had their lateral sinus obliterated, especially if there were no neck incision.

He did not think it was necessary to expose the bulb; it could be drained by passing a catheter upwards along the proximal end of the vein, and leaving the other end out of the neck. If the case was so severe as to necessitate ligaturing the vein, two ligatures should be applied and the vein divided between the two. If the vein was collapsed and a ligature had been applied in continuity, the proteolytic ferments of suppuration might dissolve the ligatured area, resulting in hæmorrhage or dissemination of septic foci. By applying two ligatures and dividing between them, however, there was just a tube of infected clot, and the products could not enter the blood-stream again.

Mr. E. WATSON-WILLIAMS said that there was no contra-indication to tying both jugular veins. In his clinic both veins had been tied, with obliteration of the sinuses, once at the same operation, and several

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times when the interval between the operations on the two sides was under a week; the patients had all done well. It seemed quite unnecessary to wait for the establishment of collateral circulation.

The condition of the sinus wall did not help one to determine what was the condition of the contents; he had been struck on many occasions by the extent and duration of a peri-sinus abscess, in cases in which there was no thrombosis. In a doubtful case needle puncture of the sinus was neither definitely diagnostic nor justifiable; if the sinus was to be opened it must be properly opened with a knife, so that the interior could be inspected. A manœuvre that he had found useful was to estimate the pulsation both by sight and by touch; when there was thrombosis, pulsation was more easily felt than seen, whereas pulsation of a normal sinus was more easily seen than felt.

Mr. E. A. PETERS, in reply to the President, said that at one end of the scale was the pronounced thrombosis case, with local tenderness or swelling over the internal jugular vein, and at the other end, septicæmic cases without thrombosis. In some early or intermediate cases thrombosis of the internal jugular did occur without local signs, so that in doubtful cases exploration of the jugular vein should be made. The valuable paper of Dr. McKenzie illustrated the widespread character of diffluent thrombosis, and indicated the impossibility of removing all the clot. Personally he was averse to removing much clot to secure a flow of blood. Packing inside the vessel provided necessary drainage and resulted in a healthy process of clotting. He appeared to agree more closely with Mr. Layton than Mr. Layton agreed with him, and would eulogise Sir Arbuthnot Lane, who cleared the vessel till he came to healthy clot.

Lake, in 1890, had used the same methods as were recently described by an Omaha surgeon.

Dr. Wright had shown to him (the speaker) specimens of pulmonary embolism, which proved the process to have been so chronic that a clot formed by a mass of platelets was overgrown by an endothelial layer from the vessel wall.

Again, a certain number of lateral sinus cases with embolism recovered. He had quoted a case of thrombosis of the horizontal lateral sinus treated by resection of the outer wall, and internal packing in either direction, when direct recovery resulted.

With regard to Queckenstedt's test, it did not indicate the presence of mural clot; the ultimate argument must of necessity be incision of the lateral sinus; he would refer to Case I.

Mr. WILSON (in reply) said that with regard to the conservative idea, various types of cases would be met with a varying technique. He would not dream of being very radical, for instance, in such a case as he had recently come across, one of cholesteatomatous mastoid, in which there was found a dirty grey-walled sinus containing breaking-down clot and pus which was completely localised by a fibrotic constriction at both the upper and lower limits of the lesion, thereby shutting off the torcular and bulbar portions of the sinus. This should in every similar case be treated as would a local abscess anywhere else in the body. The discussion, he thought, had borne out most of the

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points which he raised in the paper. Experienced men would continue to treat each case on its merits. Mr. Diggle was near the mark when he said that what was required was early diagnosis coupled with early treatment. And that, he thought, was what was being secured. The earlier the diagnosis was made, the more conservative would treatment tend to be.

CASES

Tumour in Middle Ear : Case for Diagnosis.—N. ASHERSON, F.R.C.S.

Child, aged 10. Globular, solid, pale swelling in postero-superior quadrant. No discharge ; large, central, dry permanent perforation of the tympanic membrane superficial to the tumour.

DISCUSSION.

The PRESIDENT said he could not conclude whether this condition was new growth or an organisation of granulation tissue round the end of the malleus.

Mr. HOLT DIGGLE said he regarded this as a case of attic suppuration.

Mr. SOMERVILLE HASTINGS said that it might be an exostosis, it was quite hard and seemed to be superficial to the remains of the membrana tympani. It was known that after suppuration an exostosis sometimes developed.

Carcinoma of the External Ear.—F. C. ORMEROD, F.R.C.S.

Female, aged 55. Attended hospital in January, 1929, with papillomatous growth of antero-inferior wall of right meatus. Treated with 6·5 mg. radium for ten days. Disappearance of growth. Shown at a meeting of the Section in February, 1930, with signs of recurrence. These disappeared but recurred in October, 1930. In November, 1930, a sleeve resection of the meatus was performed and 3·9 mg. radium inserted for six days, followed by some giddiness but no nystagmus or vertigo. Marked local reaction and suppuration which has resulted in a closed meatus but no sign of recurrence.

DISCUSSION.

The PRESIDENT said that the case seemed to have done very well, but complete healing had not yet taken place ; there was a small sinus in the scar. It was difficult to judge as to what was happening underneath.

Mr. A. J. WRIGHT said that one value of diathermy in removing such conditions from the meatus was that it minimised the ensuing stenosis.

Mr. ORMEROD (in reply) said that the carcinoma seemed to have been eradicated, and perhaps at a later date an attempt might be made to create a better meatus. Most of the work on this case had been done by his colleague, Mr. Chubb, who was unable to attend the meeting. The specimen had been exhibited two years ago, when it was agreed that the growth was definitely an epithelioma. Its naked-eye appearance was papillomatous.

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Societies' Proceedings

Angeiosarcoma of External Ear.—F. C. ORMEROD, F.R.C.S.

Female, aged 51. Attended with discharge and polypus in left ear; sinus behind auricle which led forwards below meatus. A polypus had been removed three years ago.

Mastoid operation, September, 1932, disclosed suppuration of middle ear and mastoid antrum. Portion of anterior wall of meatus came away on sequestrum. Polypus very vascular; section shows angeiosarcoma. Has since been treated with radium.

? Hernia of Tympanic Membrane. ? Cholesteatoma: Case for Diagnosis.—R. SCOTT STEVENSON, F.R.C.S. (Edin.).

This patient, aged 24, was seen on November 2nd, 1932, complaining of deafness in the right ear. The ear had formerly discharged from childhood up to the age of 17, and then dried up, and he had no further trouble until about the middle of July, 1932, when the ear discharged again for three or four days only.

On examination.—Right drum red and bulging. No inflammation or pain and the drum is insensitive when touched with a probe. Patient can hear a whisper only at the ear. Rinne negative; hearing by air-conduction is diminished 30 seconds for C. 128.

Is this a hernia of the middle layer of the drum, or is this a cholesteatoma, and if so, is the radical mastoid operation justifiable in view of the fact that the only symptom of the patient is deafness in the right ear? Should one do a paracentesis?

DISCUSSION.

The PRESIDENT said it was difficult to say whether it was a weakened portion of the drum which was presenting itself. It was suggestive that there was a loss of membrane in that area. It was probably something of a cystic nature which was coming through the opening. It yielded to the probe, but he could not make an impression on it with the Siegel's speculum.

Mr. A. A. SMALLEY said that this was a very important case. If pressed for an immediate diagnosis he would say that the condition was cholesteatoma; he had seen one of similar appearance which proved to be that. One might find out by incising the membrane or cyst. Before that was done, however, a good skiagram should be taken. He had had two recent cases in which the value of this was clear; and there should be an antero-posterior view of the petrous bone, as erosion by cholesteatoma, if present, will probably show up better in that view than in a lateral aspect.

Mr. SCOTT STEVENSON (in reply) said his first impression was that the condition was cholesteatoma, but when he inflated the ear it seemed then to be more like a hernia of the membrane.

[*Later report.*—X-ray examination showed no bony abnormality. After paracentesis very thick tenacious mucus was sucked out with difficulty; bacteriological examination of this was negative, showing only *Staphylococcus albus*—probably a contamination.]

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