panum contained granulations. Radical operation completed. Cold lotion applied to inner wall at end of operation at once produced conjugate deviation of eyes to the right. Posterior wound closed. May 25: No fever since operation. Posterior wound healed. All stitches removed to-day. Cavity looks satisfactory. June 13: Patient dismissed to convalescent home. June 29: Doing well.

CASE 12: *Synopsis*.—No. 362. J. M—, male, aged sixteen, first seen January 25, 1916. C.O.M.S. (right). For five days before admission headache on right side, with shivering and vomiting. Labyrinth healthy. *First operation* (radical mastoid).—Cholesteatoma present: large extradural perisinus abscess (*Staphylococcus aureus*). Sinus split up, but jugular not ligatured. Later, pain developed in right lumbar region; exploration of chest negative. *Second operation*.—Ligature of internal jugular; intravenous injection of eusol; marked tenderness over right ilium; incision here evacuated pus (*Staphylococcus aureus*). Fever continued. Operation on right ilium by general surgeon (Mr. J. W. Struthers). Large abscess between inner surface of ilium and iliatus muscle. Recovery. (Case recorded in full in *Brit. Med. Journ.*, 1917, Pt. I, p. 358.)

CASE 13: *Synopsis*.—No. 269. M. S—, female, aged thirteen, first seen January 14, 1915. C.O.M.S. (right) after measles; for one week fever, earache, vomiting and retraction of head; meningitis present on lumbar puncture. *First operation* (radical mastoid). Later, symptoms of septic sinus thrombosis developed. *Second operation*.—Sinus opened and right internal jugular vein ligatured. Later still, symptoms of cerebellar abscess. *Third operation*.—Cerebellar abscess opened and drained. Recovery. (Case recorded in full in *Edin. Med. Journ.*, November, 1915.)

(To be continued.)

PHARYNGEAL DIVERTICULA, WITH NOTES OF TWO CASES: IN ONE THE POUCH WAS REMOVED UNDER LOCAL, IN THE OTHER UNDER GENERAL ANÆSTHESIA.¹

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COMMENCING this paper with a short historical survey, I note that Mondiere (1) in 1833 described these pouches, and Rokitansky in 1840 classified them. Zenker (2) followed with an important paper in 1878, and Wheeler (3) reported a case in which the sac was excised in 1886. Richardson (4) in 1900 collected fifty-six cases. Rosenthal (5) has an important article in 1902. Kocher (13) reported cases in 1902. Halstead (6) gives a good account in 1904. Grant (7) in 1905 showed a radiogram of a pouch which he afterwards removed. Robinson (8) has a case in 1910.

Early classification divided pouches into (1) pressure, (2) traction pouches, according as to whether they were due to pushing or pulling, but it is only with the former that we are concerned.

Also it was the wall of the œsophagus itself which was formerly supposed to give way, but later investigation has shown that it is not in the œsophagus nor even between the œsophagus and hypo-pharynx that the protrusion takes place, but in the hypo-pharynx between the upper and lower segments of the inferior constrictor muscle. Hence the term "pharyngeal" has been substituted for "œsophageal" diverticula. In the great majority of cases the opening is by a transverse slit in the middle of the posterior wall of the hypo-pharynx opposite the body of the cricoid; the pouch generally deviating to the left as it passes down. Formerly, the signs and symptoms most relied on in making a diagnosis were—return of portions of undigested food hours or days after its ingestion, gurgling and eructations of gas from the throat, especially when pressure was made on the left side of the neck, also bulging in the neck low down, particularly after the taking of food. Many cases of pouch

¹ Read at the Summer Congress of the Laryngological Section of the Royal Society of Medicine, May 2, 1919.

were diagnosed as malignant disease of the œsophagus, and gastrostomy performed under this impression. But when these persons did not die as they should have done in due course according to rule, suspicions that a mistake had been made arose. Later, however, the X rays with a bismuth meal and œsophagoscopy illuminated the situation immensely, the typical shadows of the former shaped like a retort with a very much bent neck instead of goblet-shaped as in stricture being very striking. But somewhat curiously the assistance of these valuable methods was at first but little sought: for instance, Stetting, writing about his case in 1910, says, "I decided to dispense with the œsophagoscope as I deemed it unnecessary, and did not wish to subject the patient to the risk and great annoyance"; though a notable point to my mind about œsophagoscopy in these cases is the extraordinary ease with which the tube enters the sac—in fact we can hardly avoid entering it, though the opening leading to the œsophagus may require tedious search. The X rays were only called in in the above case because the patient, who was supposed to have carcinoma, did not die.

Treatment.—When operation is declined or contra-indicated, something in the way of palliation may be done by emptying the sac, keeping it clean and passing the œsophagoscope and a feeding-tube. Also patients get to know little tricks for facilitating the passage of food and relieving themselves of the undigested residua, and sometimes a sort of truss may be fitted and helps. As regards operative procedures these may be divided into two kinds: (1) those that do not require external incision; (2) those that do.

As regards (1) Chevalier Jackson (9) in 1915 says: "I have devised a method of seizing the bottom of the sac and drawing it up and cutting it off, but have not yet come across a suitable case. In the two in which it was tried spasm of the glottis was set up—a result due no doubt to pulling on the recurrent laryngeal nerve."

Mosher (10) reports three cases in which he divided the adjoining walls of the œsophagus and sac with success, but the statements which he himself made must be well noted, for he says mediastinitis is more deadly than either peritonitis or meningitis; and further on, if the œsophagus and pouch be not actually glued together by old inflammatory adhesions the mediastinum will be opened by the first cut.

(2) *With External Incision.*—The operative side of these cases seems in the early days to have been approached with fear and trembling. Even Butlin (14), writing in 1893 in reference to his first case, speaks of the gloomy outlook of the patient, though he afterwards excised the sac and cured him. In 1903, however, when he reported eight cases of incision with one death, he took a more favourable view.

He emphasises the necessity of feeding the patient through a tube passed if possible through the mouth, disturbing the parts as little as possible, stitching up the wound in the pharynx but well draining the wound in the neck.

Although Stettin's (11) tables give a high mortality, viz. nine deaths in fifty-three cases in which the pouch was excised, yet on closer examination a good many of these deaths seem avoidable, *e.g.* one from hæmorrhage from the superior thyroid artery, another from inanition, another from injection of 1 in 100 perchloride of mercury.

Halstead (6) in 1904 points out the advantages of invaginating the sac into the œsophagus, and gives successful cases.

Waggett and E. D. Davis (16) record an interesting case in 1912 in

which the sac was invaginated into the œsophagus, and ten months after recurrence took place during sneezing and excision was successfully performed.

Hill (15) showed a case at the Royal Society of Medicine in which he had drawn up the sac and stitched it to the inferior constrictor muscle, and Grant one he had treated in a similar fashion in 1919, with excellent results so far. The name "diverticulopexy" given to this operation is a rather notable scintillation which I believe we owe to Dr. William Hill.

Judd (11) in 1918 advised the operation of excision and sewing up of the neck in two stages, and Bevan's operation, in which the sac is folded up and invaginated, as the safest.

CASE I.—Pouch after removal: well-marked shrinking has taken place.

From the Mayo (12) clinic as recorded in the *Journal of the American Medical Association*, 1918, we get a list of 35 cases with two deaths from heart failure. The very great majority of these 35 were excisions.

After carefully considering these different methods of dealing with diverticula, I cannot help feeling that some of them, though ingenious, and especially the invagination operation, remind one of the device of the man who, when asked how he got a tight cork out of a bottle, replied that he did so by pushing it in. If the patient finds himself per chance in the hands of one who is not only an œsophagoscopist but also a surgeon so much the better for him. He will probably escape tinkering methods of dealing with his case on the one hand, and on the other the very doubtful advantage of the dual control of a separate surgeon and œsophagoscopist, each with his separate retinue and paraphernalia, as

recommended by Chevalier Jackson. And in conclusion I find that the dangers of the operation of excision of the sac as performed by that great surgeon and laryngoscopist, the late Sir Henry Butlin, have been much exaggerated, and I believe this to be still the best method, and I offer

Radiogram showing pouch extending down into the thorax to the level of the top of the aortic arch. CASE 1. - Pouch removed under local anaesthesia.

the following two cases as a very small item in support of this contention. I would also emphasise just a few points besides those advised by Butlin, especially the desirability of cleansing the patient's mouth and the sac, and keeping a bougie in the sac as a guide during the first part of the operation.

CASE 1.—G. W —, aged seventy, cabinet-maker, first seen in November, 1913, when he came to the hospital with the diagnosis of cancer of the throat. There was a history of difficulty in swallowing and regurgitation of food and gas for over two years, and of a variable swelling in the lower part of the neck on the left side. The patient was much emaciated, and appeared to be rapidly going down hill. Examination with the œsophagoscope and an X-ray photograph after a bismuth meal showed the presence of a large pouch. The opening leading into the hypopharynx was found after considerable search, and examination of the œsophagus demonstrated the absence of stricture below. The patient being both tolerant and intelligent, I decided to operate under local anæsthesia, thinking it would be a great advantage to avoid post-anæsthetic vomiting, so on December 3, 1913, after cleaning out the pouch, a solution made from three tabloids each containing cocaine mur. gr. $\frac{1}{2}$, morphia mur. gr. $\frac{1}{6}$, was injected subcutaneously along the anterior border of the sterno-mastoid muscle from the hyoid downwards, and a gum-elastic bougie was passed down from the mouth into the pouch, so that its extremity could be felt in the neck. An incision was now made along the sterno-mastoid, and the platysma and deep fascia divided, also the omo-hyoid muscle, but not, however, the superior thyroid artery. The pouch was now made very manifest by means of the bougie, and was found to extend down into the chest; it was carefully separated and drawn up, exposing its neck, the bougie having been previously removed. The neck was now held and a feeding-tube passed easily from the mouth into the œsophagus. An anchoring suture was passed through the neck of the sac, and a little more distally a pair of forceps applied as a clamp, and between these the neck was divided and stitched up with two layers of interrupted hardened catgut sutures. The wound in the neck was well drained. The patient suffered from a very troublesome cough, and a slight leakage took place after a paroxysm on the fifth day; this, however, closed in a few days, and the patient gained strength, and left hospital at the end of January, swallowing quite well, and with the wound healed. The radiographer, Dr. Jordan, now reported all clear. In April, 1914, he was shown at the Laryngological Section meeting. In 1917, nearly four years after the operation, he reported at hospital, and seemed quite well, having gained three stone in weight and swallowing without difficulty. On examination with the œsophagoscope only a slight puckering was visible at the site of the diverticular opening.

CASE 2.—P. W —, aged seventy, seen at the end of April, 1914, in consultation with Mr. Woakes, who also assisted me at the operation. The patient was a feeble and emaciated man, tired out by the constant regurgitation of food, drink and gas, and was sleepless, irritable and depressed; he had, however, plenty of pluck. The case was suspected to be one of pharyngeal pouch, and this was confirmed by œsophagoscopy and radiogram. The patient having been anæsthetised, the pouch was removed as in Case 1. A feeding-tube introduced during the operation was, however, badly borne, the patient being very restless, and it had to be finally removed on the sixth day. In this case also slight leakage took place after vomiting. This did not seem to delay recovery, and it would appear that a small leakage coming on late—that is, after the parts have had time to consolidate—is of very little importance. The patient went on well after the first ten days, and left the nursing home on May 27, swallowing well, and rapidly gaining weight and strength. Inquiry in March, 1919, five years after operation, elicited the reply that he was able to go out and about and swallow all right.

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