symptoms last. It has, however, been found that about eighteen months usually elapse between the first calling in of medical advice and death. In the first male case, therefore, the disease ran an unusually rapid course, death occurring only five months after he first called in his doctor and seven and a half months after being in apparently perfect health.

Summary

1. Three cases of haemochromatosis are described in all of which the diagnosis was checked by post-mortem examination.

2. A female case was diagnosed as Addison's disease during life, and the difficulties in diagnosis are discussed.

I wish to express my thanks to Professor D. M. Lyon for permission to publish these cases, which were under his charge.

REFERENCE

¹ Sheldon, J. H.: *Haemochromatosis*. Oxford University Press, 1935.

THE DRAINAGE OF THE MAXILLARY SINUS

A NEW TECHNIQUE

BY

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Sinus surgery has in recent years become very much more conservative than it used to be, and surgeons are now fully alive to the dangers of extensive interventions. This is particularly true with regard to the ethmoidal and frontal sinuses. The radical operation on the maxillary sinus (Caldwell-Luc or its modifications), however, is still very often performed. That it is not entirely devoid of complications is only too well known. It is not disputed that there are cases of gross disease of the mucosa lining the antrum where the radical operation is necessary. But the opinion is certainly prevalent that the indications for the radical operation could be, and should be, greatly reduced. Why then do many otologists have recourse to the Caldwell-Luc operation rather than the simpler intranasal antrostomy? The explanation in my opinion is that with the present technique the intranasal antrostomy often gives an uncertain result, even in the hands of the expert, and that rather than risk an unsuccessful operation the radical procedure is undertaken in preference.

Postulates in Treatment

In the majority of cases of antral disease all that is required is:

1. A sufficiently large opening, placed well forward, and level with the floor of the meatus, to enable the surgeon to remove polypi, and to allow the discharge to escape freely by gravity and the ciliary action which, as has been proved by Proetz, still persists even in the most gravely infected sinuses.

2. The restoration of the normal ventilation inside the sinus, which often becomes defective due to blockage of the normal ostium. The above desiderata are fully obtained by the intranasal antrostomy. The mucous lining, unless grossly diseased and polypoid, usually recovers after this operation.

The removal of as much bone of the antro-nasal partition as is possible has been advised, in order to give an adequate permanent opening into the antrum, the contention being the larger the opening the larger will be the communication between the antrum and the nose.

This is a fallacy. It is not sufficient to make a big opening in the bone to obtain a satisfactory communication with the antrum, nor does a big opening in the bone assure it.

The antro-nasal partition does not consist of bone only; it is actually made up of five layers—namely, mucosa, periosteum, bone, periosteum, mucosa. It is clearly not sufficient to make an adequate opening in the bony layer alone, for this does not necessarily correspond with the opening in the other layers of the partition. What actually happens is this. When piercing the bone during the intranasal antrostomy the nasal and antral mucosae are torn and indented; the bone-cutting instrument which is then used removes the bone, but not necessarily the muco-periosteum lining the bone on either side. The torn membranes are inclined to escape the bite of the forceps. Ultimately, at the completion of the operation, we have a large opening in the bone with tags of mucosa overlaying it like a curtain on either side. These tags have a real tendency to unite with each other on either side of the bone and across the opening with those on the other side. It is clear that this process is progressive, and will diminish materially the size of the antro-nasal communication. If the mucosal tags on either side of the bone do not correspond in position and size, the contraction of the original opening will be even more rapid, with the result that what appeared to be a very satisfactory foramen at the operation may become so small as not to allow the passage of an antrum cannula at the end of the second week.

That antro-nasal openings have a tendency to close up is familiar to the expert and the beginner alike. The above is in my opinion the explanation for this tendency. The success of an intranasal antrostomy depends on an adequate opening being made in all layers forming the antro-nasal wall. It is for this reason that I have for the last eighteen months practised a somewhat modified technique when performing this operation.

Technique of Operation

The operation is done under local, evipan, or chloroform anaesthesia. As the galvano-cautery burner is used during the operation ether must be avoided. The nose is packed with a 10 per cent. solution of cocaine and adrenaline one hour before, and the area below the inferior turbinate receives an extra application of cocaine and adrenaline immediately before the operation. The inferior turbinate is not interfered with, unless overhanging and obstructing the meatus, and then no more than is absolutely necessary is removed of its anterior end. The first step aims at making an opening in the nasal mucosa which should be well forward and level with the floor of the meatus. For this purpose I employ the galvano-cautery, using a flat and specially bent burner (see Figure).

Enough mucosa is destroyed to make it correspond with the future size of the communication with the antrum. An opening is next made in the bony layer of the partition; this is first pierced with a frontal sinus rasp fairly far back beneath the inferior turbinate; or a chisel may be used for this purpose. The opening is then enlarged with bone-cutting forceps, particularly forward towards the extreme anterior limit of the inner wall and towards the lower part of the antro-meatal wall. Only enough bone, however, is removed to permit the insertion of an instrument for the removal of

polypi and the free escape of antral discharge. Next the field of operation is dried carefully and a plug of gauze soaked in adrenaline is inserted in the opening and left there for a minute or so in order to stop any haemorrhage. A straight galvano-cautery burner is now introduced into the opening and applied consecutively to the whole circumference of it. This step effectively destroys all the tags of the antral muco-periosteum, making the opening in this layer of the partition correspond in size with the opening in the bone and nasal muco-periosteum.

A note of warning: if the antral opening is made to reach the roof of the meatus the burner should be applied with caution to this part on account of the proximity of the lachrymal duct.

Conclusions

Altogether eighteen cases have been operated upon by the above procedure, the antro-nasal opening having remained patent in all of them; the first patient was treated eighteen months ago.

In the few radical operations I have performed during this period the galvano-cautery was used to make the opening in the nasal and antral muco-periosteum. Here again less bone was removed than is usually advised. While polypi and diseased mucosa were dealt with the antrum was never entirely stripped of its lining.

To ensure a permanent opening to the antrum it is not sufficient to make an adequate opening in the bone. Tags of antral and nasal muco-periosteum which are left behind have a tendency to diminish materially the opening into the antrum. It is necessary, therefore, to make adequate openings in the other layers of the antro-nasal partition—the muco-periosteum lining the bone on either side. It is not necessary to remove an excess of bone in the hope of ensuring an adequate communication with the antrum. The operation is a simpler procedure, with less haemorrhage, less post-operative pain, and a shorter convalescence than the usual antrostomy.

Clinical Memoranda

Case of Nitrite Poisoning

There is no mention of any case of death from nitrites in the standard textbooks on medical jurisprudence, though nitrites are known to be poisonous, converting oxyhaemoglobin into methaemoglobin and acting not only as gastrointestinal irritants, but also as cerebro-spinal poisons. The following case of poisoning by potassium nitrite is of interest.

CASE REPORT

A boy, aged 15, was found in convulsions and in an unconscious state at a railway station; in one pocket was a packet containing a white powder. He was removed to hospital, and died five minutes after admission. The medical officer at the time of admission noted that the finger-tips were blue. The viscera and the suspected powder were sent to us for analysis. We found the powder to be potassium nitrite, weighing about 463 grains. We extracted from the stomach and contents nitrite equivalent to about 86 grains of potassium nitrite. In the sample of urine, one ounce of which had been preserved by the addition of three ounces of spirit, we found nitrite equivalent to about 85 parts of potassium nitrite per million, corresponding to about 340 parts of potassium nitrite per million in the undiluted urine. This urine showed almost complete absence of urea when treated with potassium hypobromite.

The method of analysis used for the stomach and contents was aqueous extraction of nitrite, using mercuric chloride to obtain a protein-free filtrate (vide *Allen's Commercial Organic Analysis*, fifth edition, ix, 433). The nitrite was determined by addition of potassium iodide to an aliquot portion of the filtrate and titrating the liberated iodine with sodium thiosulphate in an atmosphere of carbon dioxide. For

the urine the colorimetric method of determination was used, adding a mixture of solutions of alpha-naphthylamine hydrochloride and sulphanilic acid acidulated with hydrochloric acid, and comparing the pink colour with standards containing known dilutions of potassium nitrite. We did not receive a sample of the blood in this case for spectroscopic detection of methaemoglobin. Notes of the necropsy, so far as they are available, are as follows: The body was well nourished and rigor mortis was well marked. The features were calm, the eyes semi-closed, and the pupils normal. The mouth was clenched, and the position of the tongue was normal.

The pericardium contained about half an ounce of serous fluid. The heart was normal in shape and appearance, and the cavities on the right side were full of dark fluid blood, while the left ventricle contained about half an ounce of dark fluid blood, and the left auricle was empty. The lungs were normal in appearance, colour, and consistence.

The liver weighed thirty-three ounces, and the gall-bladder was full. The spleen contained three hard thick nodules, and the pancreas was normal. The stomach was normal and contained about 12 ounces of a thick brownish liquid. The kidneys and bladder were normal, and the latter contained one ounce of urine.

The membranes of the brain were injected. The brain substance weighed about 48 ounces, and the brain and the ventricles were normal.

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Gonoderm Vaccine in Gonorrhoeal Ophthalmia

On December 10th, 1935, I saw a newborn baby suffering from gonorrhoeal ophthalmia in both eyes.

On examination I made out that the right eye was affected more severely than the left; the lids were markedly swollen and oedematous, and there was a profuse purulent discharge which covered the cheeks. On separating the lids with a retractor the right cornea was seen to be opaque throughout its whole extent and perforated in the centre, the iris protruding through the perforation. The left cornea was a little better, though this was also oedematous, opaque, and had a perforating ulcer. Silver nitrate applications, frequent washings with weak permanganate lotion, argyrol drops, and noviform ointment were administered locally, whilst daily parenteral injections of 1/2 c.cm. of milk were given. The treatment had very little effect on the quantity of pus, and the cornea of both the eyes became more opaque with a bigger staphyloma bulging through the right cornea. A bad prognosis was given as regards sight.

At this juncture, on December 17th, "gonoderm vaccine" was brought to my notice, and was administered intradermally on the same day. The dose given was 0.05 c.cm. with three parts of diluent fluid. The next day there was a severe local and general reaction, with distinct improvement in the eye condition; within forty-eight hours there was marked diminution in the quantity of discharge and the child for brief intervals could keep its eyes open. A second dose of 0.01 c.cm. was administered on February 24th, 1936. There was progressive improvement, and the infant could keep its eyes open even in bright daylight. There was hardly any purulent discharge by the beginning of March. On March 16th the right cornea appeared normal except for the presence of a small macula at the upper part, and the left cornea had cleared a great deal, giving hopes of restoration of some sight with iridectomy.

I have also used the vaccine in three more cases of gonococcal iritis and found it very useful. The object of this brief communication is to bring to the notice of the profession a notable therapeutic agent to combat lesions of the eye due to gonococci.

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** "Gonoderm vaccine" is the term used in India for gonococcus soluble toxin (Corbus-Ferry), which is prepared for administration by intradermal injection only.