ANTRAL RHINOLITHS

By OLIVER C. LORD (Leeds)

THE presence of a rhinolith in the nasal cavities is not uncommon, and one or two cases occur each year in a large E.N.T. clinic. There is no recorded instance of a rhinolith forming in the frontal sinus, and its occurrence in the antrum is very rare, only six cases have been recorded in the literature and only one case in English publications. It seems, therefore, appropriate to review the literature and record a further case which I have had the opportunity of treating.

Review of the Literature

The first two cases are recorded in ancient medical works of the years 1686 and 1738 respectively. The earlier one was described anonymously and the later one by Lanzoni, although Oppikofer comparing the two Latin texts concluded that the two accounts referred to one and the same case, Lanzoni's description being a copy of the first. The patient suffered for many years with a vesical calculus which was removed by operation. He was then troubled by great pain in his right upper jaw followed by an external swelling, which was incised and a hard irregular stone, the size of a pea was removed.

Zuckerkandl described a case after death in which there was expansion of the antrum with bulging into the nose and broadening of the alveolar margin. A stone about the size of a hazel nut, whose structure corresponded exactly with that of a rhinolith, was removed from the antrum, but owing to decomposition the condition of the antral mucosa could not be determined.

Harke's case also observed post mortem described a stone, the size of a pea found in an antrum full of foul pus.

The case described by Kahnity presented as a profuse epistaxis. The right antrum contained offensive purulent material and a chalk stone, the size of a hazel nut, which had eroded a branch of the internal maxillary artery. There is no description of a nucleus occurring in these cases.

Oppikofer's case was a woman, aged 60 years, who had complained for 20 years of muco-purulent discharge from the right nostril usually moderate in amount, but occasionally profuse and fœtid and accompanied by pain in the right side of the face. Exploration of the right antrum showed a considerable amount of fœtid pus. The Caldwell-Luc operation was carried out, and a stone was found in the floor of the antrum, in size rather larger than a hazel nut. Its chemical composition resembled

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a rhinolith but there was no exogenous nucleus. Oppikofer then states that histological examination of the antral mucosa showed extensive carcinomatous change and since this had been removed completely there was no recurrence. It seems probable that chronic inflammatory changes in the antral mucosa gave a fallacious impression of malignancy.

A. J. Wright reports a case of a rhinolith occurring in the antrum in a male, aged 24 years, who had eight years history of nasal discharge due to right-sided fronto-ethmoidal and antral suppuration. Drainage of the frontal and ethmoidal sinuses and the antrum was carried out intranasally. This failed to clear the condition and Howarth's operation on the frontal sinus was performed. Six weeks later the patient blew out from the right side of the nose, a foreign body which proved to be a rhinolith. The nucleus was the root of a molar tooth which had been removed years before, the root apparently being displaced into the antrum at the time and suppuration ensued with subsequent incrustation around the tooth nucleus.

Case Report

G.A., a male of 50 years attended the out-patient department of the General Infirmary at Leeds in July 1942 complaining of left-sided nasal obstruction and purulent discharge of some twelve months' duration. Only slight discomfort was experienced at first but for the preceding two months the nose had been very troublesome. There was no history of frequent colds or previous nasal trouble, or the introduction of a foreign body into the nose. His teeth had been extracted two years previously and this had caused no nasal trouble or undue discomfort. Examination of the nose showed the left side to be full of typical polypi arising in the middle meatus and associated with purulent discharge. Transillumination of the sinuses demonstrated dullness of the left antrum. The right nostril and sinuses were clear. The polypi were visible on examination of the post nasal space. Antral lavage showed much pus and a diagnosis of chronic unilateral antral and ethmoidal suppuration with polypi was made. No radiograph of the sinuses was taken.

In August 1942, under general anæsthesia, a left Caldwell-Luc operation was performed. This showed the antrum to be full of non-fœtid pus, which after aspiration revealed a calculus lying free in the antrum. The calculus was removed. The antral mucosa, being thickened œdematous and polypoidal, was removed. There was nó suggestion of malignancy. The usual intranasal opening was made into the inferior meatus and intranasal ethmoidectomy with removal of the polypi and drainage of the ethmoid cells was carried out. There was no evidence of frontal sinus infection.

His progress was very satisfactory. He was seen two weeks after

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operation when the nose was healing well. He had no further complaints and was seen by request in August, 1944. He felt very well and his nose caused no trouble whatsoever. Examination showed no recurrence of polypi, the opening into the antrum was patent and there was no evidence of infection. Transillumination of the sinuses was quite clear.

Description of the Antral Rhinolith

This was an oval shaped stone measuring 18 by 13 by 6 mm. It resembled a plum stone in shape and size and possessed a craggy, irregular surface. (See Figs. 1 and 2.) It was stony hard in consistency and of a dark brownish-grey colour. The weight was 720 mgm. The outer calcareous shell of one surface, varying in thickness between 1 and 2 mm. was removed. This revealed a little dry debris, but beneath this forming the core and measuring 10 by 7 by 3 mm. was a collection of paper, now in several small pieces but probably at one time composed of one rolled-up portion. Printing was clearly visible on at least two pieces, the letters " e " and " l " being quite distinct. (See Fig. 3.) The paper had obviously formed a nucleus around which incrustation had occurred. The small part of the rhinolith removed was kindly examined by Dr. Fowweather who reported: " This rhinolith consists mainly of Calcium phosphate together with a small amount of carbonate and some organic matter." Having with certainty discovered a nucleus the specimen was preserved.

Discussion

It is interesting to consider the probable sequence of events in the formation of this rhinolith in the antrum. It seems certain that a piece of paper was introduced into the nose at some time, this is most likely to have taken place in childhood. This foreign body has then passed from the nose into the antrum through the normal ostium, an extremely unusual sequence, and the presence of a piece of paper instigated suppuration in the antrum. Presumably as in the formation of an ordinary rhinolith the pus became concentrated by the air current in the nose and antrum, and by inadequate drainage. In consequence the pus was concentrated beyond the point at which salts, especially calcium will remain in solution. These were then precipitated on the surface of the paper causing incrustation and the subsequent formation of the rhinolith.

Such would appear to be the method of formation of the rhinolith in this case. Several interesting features however are revealed. We know it is not uncommon for children to introduce pieces of paper into the nose. Furthermore a nucleus of paper is not infrequent in a rhinolith. Polson reviewing the literature found a paper nucleus in 13 out of 209

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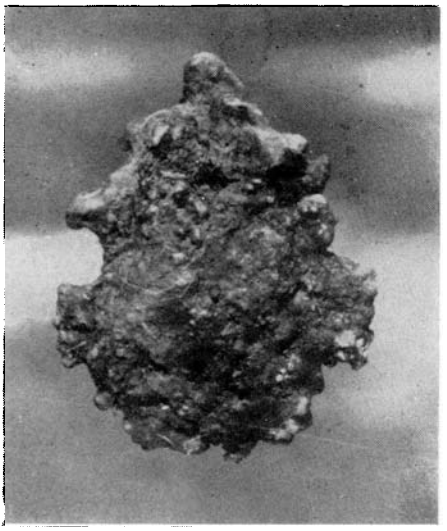


FIG. 1.

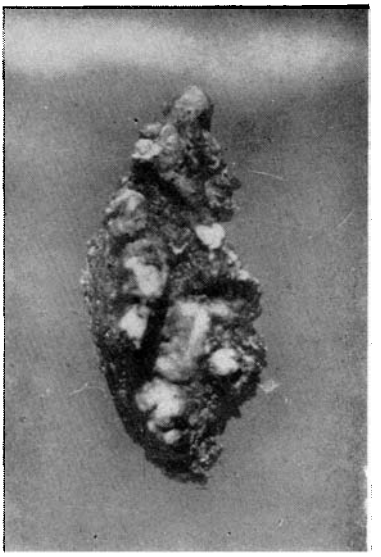


FIG. 2.

Photographs of antral rhinolith after removal (magnification ×3).

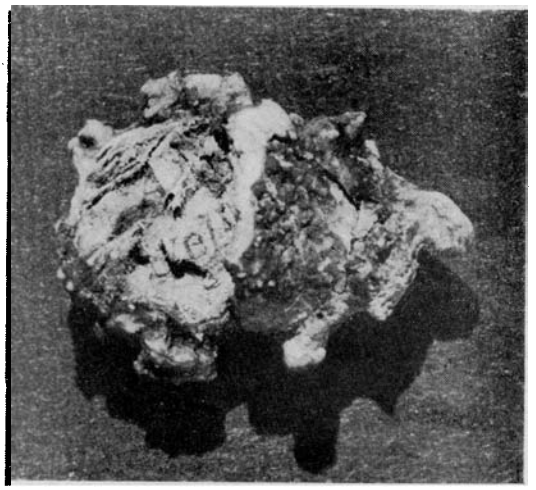


FIG. 3.

Antral rhinolith after removal of part of outer shell to show the paper nucleus. Note the printed letters on the paper.

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rhinoliths. It is extremely rare for a foreign body of any appreciable size to pass from the nose *viâ* the maxillary ostium into the antrum. Newcomb discussing foreign bodies in the antrum found isolated examples where a small piece of paper, a fragment of wood or a piece of cotton wool had taken this very unusual course, but no other instances are on record.

Foreign bodies occasionally gain entrance to the antrum by an abnormal route due to trauma by accident or operation. They are usually teeth, but bullets and other missiles are seen from time to time. A peg or other object not uncommonly slipped into the antrum following the obsolete operation for drainage of an infected antrum through the alveolus. The presence of a foreign body in the antrum, however, does not always produce incrustation or indeed infection, for Irwin Moore recorded a case where a piece of aluminium remained in the antrum for 25 years without either taking place.

All the recorded cases of antral rhinolith have been associated with suppuration in the sinus and it seems likely that incrustation is a sequel to infection. In this case it appears reasonable to assume that the paper nucleus was present in the antrum for some considerable time, probably many years, and it was later when infection occurred in the antrum or latent infection became active and subsequently involved the ethmoids with the formation of polypi, that symptoms were produced causing the patient to seek advice.

The first recorded cases contained no description of a nucleus, but there is no suggestion of a search being made. In Oppikofer's case where no nucleus was found after examination, it is nevertheless difficult to exclude an endogenous nucleus, and for incrustation to occur around some inspissated pus or blood clot. Wright's case and the present one showed definite evidence of an exogenous nucleus.

An antral rhinolith is unlikely to produce symptoms *per se* but these depend on the coincident infection in the sinuses. Radiography would appear to be important in the diagnosis, but so far no case has been recognized before operation by this means, as all have been found accidentally at operation or ejected spontaneously following drainage of the antrum. The treatment of an antral rhinolith, as for any foreign body in the antrum, is without doubt the Caldwell-Luc operation, for this ensures easy removal and enables appropriate treatment to be given to the infected sinus at the same time. A small calculus could be removed whilst carrying out intra-nasal antral drainage but this is by no means as certain as the radical operation.

There is insufficient evidence to suggest that an antral rhinolith predisposes to malignant disease, but in view of its rarity a rhinolith is not a factor of importance in the ætiology of the malignant antrum.

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Oliver C. Lord

Summary

An antral rhinolith is described which was discovered at operation for the removal of nasal polypi, and drainage of an infected antrum by the Caldwell-Luc operation. The nucleus was a piece of paper which had passed into the antrum *viâ* the ostium. It is suggested that incrustation occurred following suppuration in the antrum. Six previously recorded cases are reviewed.

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