Paranasal sinus mucocoele: Clinical features and treatment of 13 cases in a maxillofacial unit

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إن عالبية الأورام المحاطية التي تصيب الجيوب حول الأنفية ،خاصة الجيب الجبهي والتي تمتد الى القحف والحجاج يتم وصفها من قبل أخصائي الأنف والأذن والحنجرة وجراحي الأعصاب ، في حين يصف جراحي الوجه والفكين القليل من تلك الحالات .

نصف في هذا المقال ١٣ حالة ورم مخاطي في الجيوب حول الأنفيه تم علاجها في وحدة جراحة الوجه والفكين لأحد المؤلفين خلال فترة ٢٥ سنة . تعتمد خبرتنا على المظاهر السريريه والعلاج الجراحي . يعتبر الورم المخاطي الذي يصيب الجيب الجبهي الأكثر حدوثاً (٥ حالات) يتبعه الجيب الجبهي الغربالي (٣ حالات) جبهي مع امتداد قحفي (حالتان) الجيب الغربالي (حالتان) الجيب الوتدي (حاله واحده) ومتوسط عمر المرضى كان ٤٧،٠٨ سنه .

تم استخدام الطريق عبر الوجه في جميع المرضى الذين لم يكن هناك لديهم مايدل على انتشار المرض الى داخل القحف . الشقوق المستخدمه كانت : ٢ شق جبهي مضاعف ، ٥ شق حاجبي و ٦ شقوق عبر الحاجب العلوي . لم يكن هناك نكس في أي من الحالات بعد متابعة تراوحت بين ٦ ١٢ شهر . لم نتمكن من متابعة أي من الحالات بعد تلك الفترة للأسباب التالية :-

تكاليف الانتقال الى المستشفى . الجهل.

انتقال المريض أو أقربائه خارج المدينة التي أجريت فيها العملية الجراحية.

احتمال موت المريض لأسباب أخرى .

لذلك نستنتج أن الأورام المحاطيه التي تصيب الجيوب حول الأنف هي آفات سليمة إنما يجب متابعتها الى فترة أطول للتأكد من عدم حدوث أي نكس وخاصة في تلك الحالات التي لايمكن استئصال البطانه بشكل كامل بسبب صعوبة الوصول إليها خلال الجراحة .

Most paranasal sinus mucocoeles, particularly frontal sinus mucocoele with intracranial and intra-orbital extensions are often reported by otolaryngologists and neuro- surgeons and only very few cases are referred to the maxillofacial surgeons. We report 13 cases of paranasal sinus mucocoele treated at the Maxillofacial Unit at Ikeja, Nigeria over a period of 25 years. Our experience is based on the clinical features and surgical treatment. In order of frequency of occurrence, frontal sinus mucocoele (5) is the most common, followed by fronto-ethmoidal (3) frontal with intra-cranial extension (2), ethmoidal (2), and sphenoidal (1). The mean age of the patients seen is 47.08 years.

Transfacial approaches were used in all the patients who did show evidence of the disease in the intracranial region. Of all the incisions carried out, 2 were bicoronal, 5 paralateral and 6 were through upper eyebrow approaches. No recurrence was noticed in all the cases after a follow-up period of 6 to 12 months. All the patients were later lost to follow-up probably for a variety of reasons.

We therefore concluded that although paranasal sinus mucocoele is benign in pathology, it should be followed up for a longer period for evidence of recurrence, particularly, when the lining may be incompletely removed because of poor accessibility at surgery.

Introduction

Berthon[1] reported that frontal mucocoele was first described in the medical literature by Dezeimeris in 1725 and also claimed that the first detailed account of frontal mucocoele was by Langebeck.[2] However, Berthon was the first to discuss the treatment of the condition.

Adekeye et al[3] reported that Howarth[4] in his Hunterian lecture defined a mucocoele of the frontal sinus as the accumulation and the retention of mucous secretion within the sinus owing to obstruction of its outlet with thinning and possible distension of one or more of the walls of the sinus. The term "suppurating mucocoele or pyocoele" is used when the contents of the cavity are purulent as a result of either repeated incisional or aspiration biopsies or through nasal infection.

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Mucocoeles of other paranasal sinuses are relatively uncommon and even less commonly seen are the ones involving the maxillary sinus. The literature shows that the frontal, fronto-ethmoidal, ethmoidal and the sphenoid sinuses are most frequently involved in that order. However, Jones et al[5] and De[6] each reported a case of maxillary mucopyocoele.

Controversies still exist regarding the aetiology, pathogenesis, diagnosis and the surgical approaches to paranasal sinus mucocoele.[7] Occipitomental and antero-posterior views of the skull may confirm the diagnosis of some paranasal sinus mucocoele. However, Price et al[8] reported that CT scan or Magnetic Resonance Imaging (MRI) will radiologically give additional information of the presence of all paranasal mucocoele.

Brown and Goodhill[9] classified mucocoele into two types, primary and secondary. The primary mucocoele is said to arise as a cyst from a goblet cell gland which grows to such an extent as to

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expand the sinus. The secondary type is due to an outlet obstruction as described by Howarth.[4] There is no standard surgical approach to all paranasal sinus mucocoele. Transfacial approaches may be used in all cases where there is no evidence of the disease in the intracranial region. However, Har-El et al[10] advocated the use of marsupialization in the treatment of all mucocoeles and recorded no evidence of recurrence in all the 16 patients treated by this method. Whatever the choice of surgical approach to paranasal sinus mucocoeles, the goals of the treatment are relief of the symptoms due to compression and prevention of recurrence.[11]

The clinical features of paranasal sinus mucocoeles depend on the sinus affected and the duration of its existence. This slow-growing polyp-like cysts of the sinus may be sterile in composition or harbour purulent infection.[12]

It is our wish to contribute to the clinical features and therapeutic treatment for paranasal sinus mucocoeles by reporting our clinical experience on 13 cases seen over a period of 25 years.

Cases **Report**

All the patients in this study were seen and treated at the Maxillofacial Unit of Ikeja General Hospital. The age range in years was 20 - 80. The thirteen patients were eight males and five females. Duration of the paranasal sinus mucocoele varied between 2 and 40 years with a mean of 11.69 years.

The affected paranasal sinuses mucocoele were classified in order of occurrence as follows: frontal (5), fronto-ethmoidal (3), frontal sinus involving intra-cranial fossa (2), ethmoidal (2), sphenoidal (1). Orbital involvement affecting either the right or the left eye was also observed in these cases with their presenting symptoms. There was involvement of the left eye in 9 cases (69.23%) while 4 (30.76%) affected the right eye. Transfacial approaches were used in all cases except in those cases involving the intra-cranial region where bicoronal flap approaches were used for easy accessibility. All the patients were treated post-operatively with analgesics and antibiotics intravenously for five days.

Clinical Findings

The clinical features of the paranasal sinus mucocoele varied according to age, location and duration of mucocoele, and any previous surgical treatment. Paranasal sinus mucocoeles were usually painless. The most common symptoms were swelling and orbital displacement. In treated cases of moderately long duration, there were complaints of diplopia, pain, rhinitis and proptosis. In two cases with intra-cranial extensions which were left untreated over a long period, the swellings were unusually large with severe* proptosis and blindness of the affected eye (Fig. 1). Occipitomental view of the skull showed destruction of one or two of the walls of the sinus (Fig. 2). Antero-posterior view of the frontal sinus mucocoele showed a thick cortical bone as evidence of the lateral wall of the sinus.

Fig. 1. A gigantic frontal sinus mucocoele with intracranial extension and involving the left eye.

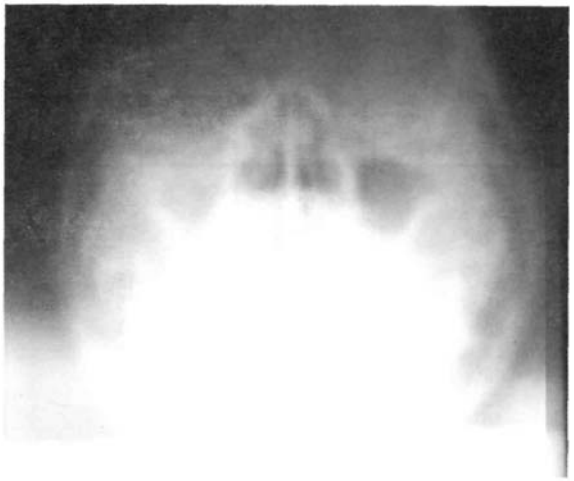

Fig. 2. Occipito-mental view of the frontal sinus showing extensive bony destruction.

There was a nasal discharge of a black-greenish fluid in one of the cases and another with frontal mucopyocoele also discharged a thick black-greenish fluid. At operation, the cystic lining was thick and friable in mucopyocoele while in the uninfected cases, the lining was thinner and could be held gently with an Allis forceps. The cases of ethmoidal sinus mucocoele were approached via the upper eyebrow (Fig. 3).

Fig. 3. Photograph showing patient with fronto-ethmoidal sinus mucocoele.

In our series, paranasal sinus mucocoele was not seen below the age of 20 years and neither was there involvement of the two eyes in one long standing case of 40 years. The range of duration before noticeable symptoms were perceived by the patients was 2 - 40 years with a mean of 11.69 years. The benign nature of the disease was associated with a long duration and absence of recurrence in adequately treated cases. Table 1 shows distribution according to age, sex and duration in years of paranasal sinus mucocoeles. Table 2 shows the order of frequency of occurrence and the orbital involvement while Table 3 shows types of incisional approach to the sinuses.

Table 1. Distribution according to age, sex and duration.

Age in Years	Sex	Duration in Years
38	M	5
56	F	25
25	M	3
78	F	35
64	F	18
45	M	5
20	F	3
80	F	40
60	M	5
40	M	4
30	M	2
28	M	2
48	M	5

Mean duration: 11.69 years
Male : Female ratio **1.6:1**

Table 2. Order of frequency of occurrence and orbital involvement.

Paranasal Sinus	No. of Patients	%Of Patients	NO. Of Orbital Involvement
Frontal	**5**	38.46	**-R 5 L**
Frontoethmoidal	**3**	23.08	**1 R 2 L**
Frontal Sinus with Intracranial Extension	**2**	15.38	**-R 2 L**
Ethmoidal	**2**	15.38	**2 R -L**
Sphenoidal	**1**	7.69	**1 R -L**
Total	**13**	99.99	**4 R 9 L**

Table 3. Type of incisional approach.

No. of Patients	% of Patients	Type of Surgical Approach
2	15.38	Bicoronal flap
5	38.46	Paralateral
6	46.15	Upper eyebrow
Total 13	99.99	

Discussion

Mucocoele of the paranasal sinus are relatively uncommon and are even less commonly seen in maxillofacial surgery clinic. In a period of 25 years, 13 cases of paranasal sinuses mucocoele were seen by the authors as compared to 48 cases seen within 5 years by Lund.[12] Maxillary sinus mucocoele is rare and only two cases have been reported so far in the English Literature.[5,6] We did not record a case of maxillary sinus mucocoele in a period of 25 years.

Controversies still exist regarding the aetiology, pathogenesis, diagnosis and surgical management of paranasal sinus mucocoele.[7] Mucocoele has been classified into two types: primary and secondary.[3] The primary mucocoele is said to arise as a cyst from a goblet cell gland which grows to such an extent as to expand the sinus. The secondary type is due to an outlet obstruction in the fronto-nasal duct due to inflammatory changes or a growth such as osteoma in the region of the duct. Other causes of outlet obstruction include allergy, polyposis, tumour metastasis and neuro-surgical procedure involving the frontal sinus.[4]

Whatever the aetiology of the paranasal sinus mucocoele, the goals of the treatment are relief of the symptoms due to compression and prevention of recurrence.

Dural involvement and intra-cranial extension of the mucocoele is best diagnosed pre-operatively by lateral skull tomography to showthe posterior wall of the frontal sinus. Equally, occipitomental view of the skull may confirm the diagnosis of the frontal and maxillary sinuses mucocoeles. Price et al[8] reported that the use of CT scanning and MRI in the pre-operative diagnosis may give additional informations.

Several surgical approaches to the treatment of paranasal sinus mucocoele have been reported. Because of the benign nature of the pathology, it is mandatory to choose the approach that minimizes the surgical trauma. The surgical approach we prefer for frontal sinus mucocoele with intra-cranial and intra-orbital involvement is the bicoronal flap which enables full access to the entire frontal bone, supra-orbital rim, orbital roof, orbital content and central regions. The incision line at the hairline gives an excellent cosmetic result although the patients may be left with residual numbness of the forehead. Two of our cases with intra-cranial involvement were treated by bicoronal approach.

Transfacial approaches were used in the other 11 cases. Of all the incision performed, 5 were paralateral and 6 were through upper eyebrow approaches. Voegels et al[13] reported the therapeutic treatment of a large fronto-ethmoidal mucocoele with intra-cranial and intra-orbital extension, with functional endoscopic sinus surgery and after a period of follow-up of one year without recurrence suggested that regardless of the size of the paranasal sinus mucocoele, endonasal endoscopic approach is adequate.

Traditionally, the removal of the lining and the mucocoele is emphasized to achieve a cure. In Europe, many surgeons have been treating sinus mucocoeles by draining and marsupialization without complications. Her-EI et al[10] suggested that if a wide marsupialization can be achieved by an entirely endoscopic approach, there are advantages including notably a lack of facial scarring in children and adults.

In our series, paranasal sinus mucocoele is not seen below the age of 20 years. This is probably due to the fad that more cases are seen by otolarngologists and neuro-surgeons as against 13 cases in 25 years seen in our Maxillofacial Unit.

Conclusion

If neglected, paranasal sinus mucocoele will grow into giant lesions, which owing to their sizes and local extensions may present problems in subsequent surgical management. Even though there are other surgical approaches to giant frontal sinus mucocoele with intra-cranial and intra-orbital extension, we believe in the bicoronal flap approach because it gives an excellent access and visibility and the hidden incision line under the skin produces good cosmetic results. Regardless of the size of the lesion, recurrence is uncommon after follow-up of 12 months. However, there is need for longer follow-up because few cases of recurrence have been reported in the literature.

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