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Cholesterol granuloma of the frontal sinus. A case report*

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SUMMARY *A rare case of chlolesterol granuloma of the frontal sinus is reported. The pathogenetical mechanisms and the tumour's behaviour are discussed on the basis of the patient's, the radiologic examination and the pathologist's finding's. A follow-up of three years is given.*

Key words: cholesterol granuloma, frontal sinus, pathology

INTRODUCTION

Cholesterol granuloma of the paranasal sinuses, is a very rare entity, few cases of which are reported in literature (Graham and Michaels, 1978; Hellquist et al., 1984; Gatland et al., 1988). A well-known condition in the middle ear and mastoid cavities (Haegstromm, 1916; Friedmann, 1959; Grippaudo, 1959; Ferlito, 1970; Friedmann, 1971), cholesterol granuloma is also found in the testis (Lin, 1979), thyroid, large and medium arterial atheromas (Gatland et al., 1988), and uterine canals (Sakamoto, 1967).

Cholesterol granuloma derives from haematic cholesterol that precipitates as cholesterol crystals, starting a chronic inflammation with foreign body cells and following granuloma formation (Sakamoto, 1967; Ferlito, 1970; Hellquist et al., 1984; Gatland et al., 1988).

We describe here a cholesterol granuloma that originated in the fontal sinus, presenting the etiopathogenetic mechanism that could be considered in this particular case.

CASE REPORT

The patient, an 80-year-old female, came to us complaining of a tumour, soft in consistency, fluctuant and not pulsatile, situated in the left inside superior angle of the orbit. The ocular globe was displaced down- and outwards, with consequent diplopia and slight exophthalmus, partially reducible with finger pressure. No neurological symptoms were present. The skin looked normal and did not adhere to the underlying plane.

In the patient's history, there were neither orbital or fronto-ethmoidal traumas, nor surgical operations. A standard X-ray showed an opacity in the left frontal sinus extending to the left ethmoid and in the orbit without sclerotic reactions in the surrounding bone structure (Figure 1). The supero-internal left orbit wall, the anterior frontal sinus wall, and the left etbmoidal cells showed bone compression. A subsequent CT-scan investigation confirmed the localization of the lesion and excluded an intracranial invasion (Figure 2). The radiologist gave a diagnosis of a suspected mucocele.

The patient was then submitted for a frontal sinus opening, wide antrostomy, and complete removal of the yellowish material contained inside. At microscopical examination (Figure 3), the lesion consisted of tissue rich in cellular elements and rhomboid-shaped fissures, being the imprints of the cholesterol crystals dissolved during tissue preparation. Surrounding the cholesterol granules, there were foreign-body giant cells, lymphocytes, foamy cells, polymorphous

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neutrophilic cells and fibroblasts. There were haemorrhagic traces too, with erythrocytes in degeneration, and macrophages containing haemosiderin. The pathologist diagnosed eventually a cholesterol granuloma.

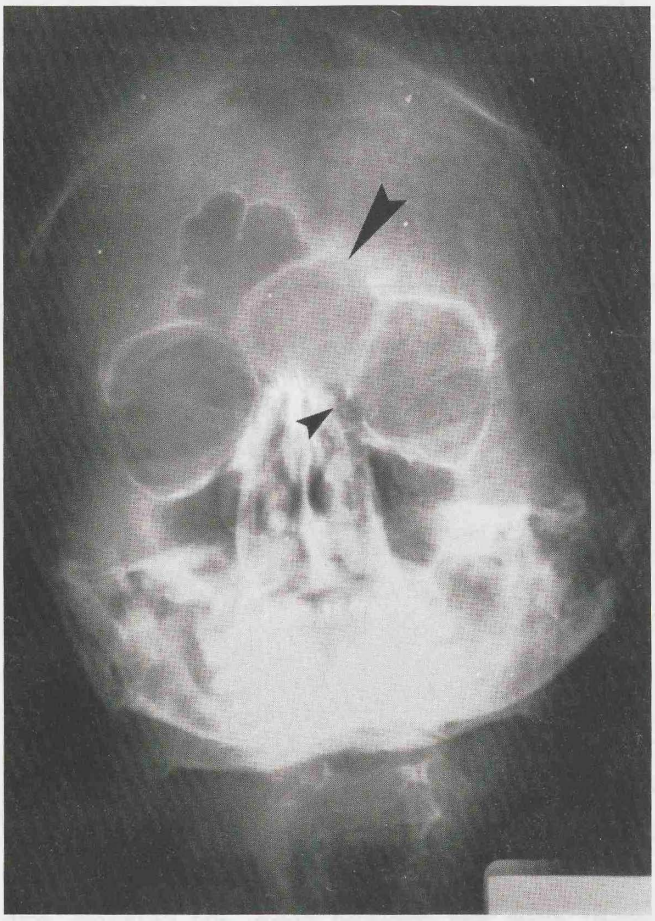

Figure 1. X-ray: The left frontal sinus (large arrowhead) is occupied by an opacity extending in the left ethmoid and orbit (small arrowhead).

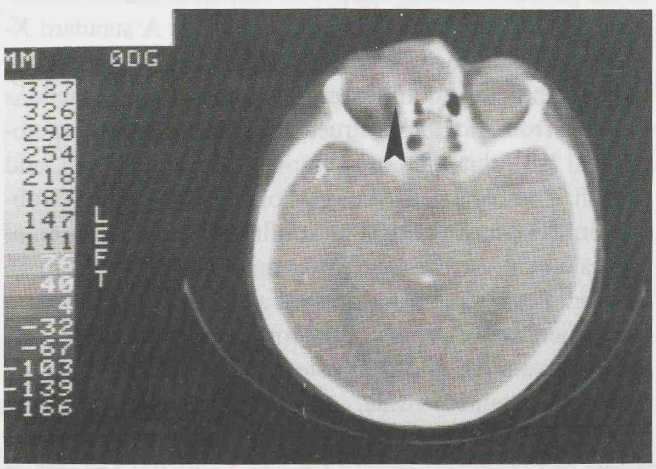

Figure 2. CT scan: The localization of the tumefaction (arrowhead) is confirmed and an intracranial extension can be excluded.

Figure 3. Light micrograph showing the negative prints of the cholesterol crystals, a mong which are foreign-body giant cells, erythrocytes, and macrophages containing haemosiderin (x 125).

DISCUSSION

Cholesterol granuloma of the nose and paranasal sinuses develops in occluded spaces. An obstruction in the ostium of a paranasal sinus can follow surgical intervention, but also chronic inflammation and nasal and sinus trauma with subsequent blood effusion. As alternative mechanisms, spontaneous haemorrhages can follow sinus polyposis, cysts or chronic sinusitis (Hellquist et al., 1984; Gatland et al., 1988). None of these situations occurred in our patient; moreover, cholesterol serum levels were normal. We are not able to elucidate the exact mechanism of cholesterol granuloma formation, with the anamnestic data given. We can only assume a chronic, progressive serous haemorrhagic exudation, without evident bleeding from the nose.

The radical resection and wide aeration of the sinus performed gave our patient a full recovery. Three years later she is absolutely free of symptoms correlated with the initial pathology, and a CT scan carried out for routine follow-up shows a satisfactory recovery (Figure 4).

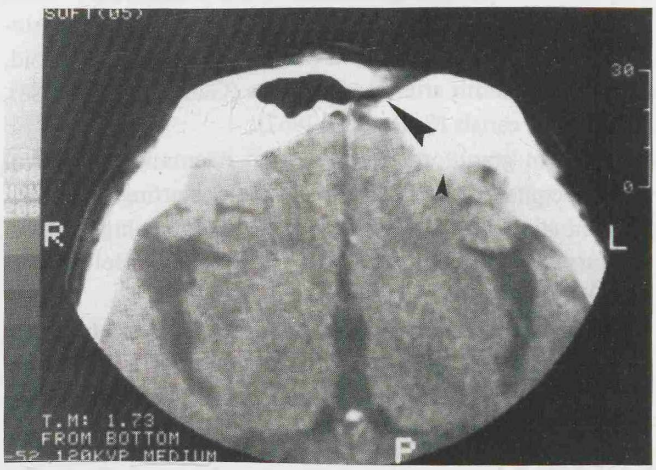

Figure 4. No lesions are shown on this CT scan, performed three years after the intervention. The left frontal sinus is occupied by fibrous tissue (large arrowhead) and the posterior wall of the sinus is thickened (small arrowhead).

It is not possible to make a diagnosis of cholesterol granuloma of the paranasal sinuses on the basis of the anamnestic data and of the standard radiological evaluation only. The X-ray characteristics of the lesion are not distinguishable from that of a mucocele, as in our case was initially suspected, or that of an aspecific inflammation of the paranasal sinuses. Even the CT scan can not give information for a pre-operative diagnosis of cholesterol granuloma. MRI is the technique of choice when a cholesterol granuloma is suspected. Such lesions have a characteristic high-intensity signal in T1- and T2-weighted images (Kumar and Dobben, 1988). Unfortunately, considering the extremely rarity of the lesion, we did not include this examination in the standard pre-operative procedures. For the surgical purposes, X-ray and CT scans can appreciate the growth behaviour of the lesion and eventual invasion into the surrounding structures. These data permit to assess the intracranial or intraorbital evolution of the lesion and, therefore, the need for a neurosurgically combined approach. No indications concerning the nature of the lesion were obtained, and therefore the final diagnosis came to us only from the pathologist.

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