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Synovial osteochondromatosis of the temporo-mandibular joint

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Abstract
A rare case of synovial osteochodromatosis of the temporo-mandibular joint is presented. Important diagnostic information can be obtained by CT, MRI, 99m Tc bone scan and aspiration biopsy. Observation using a light microscope showed mild cellular atypia, but the hallmarks characteristic of chondrosarcoma were not found. Observation using an electron microscope showed the mature chondrocytes contained a well-developed rough endoplasmic reticulum. Histological evaluation indicated that the present case was benign synovial osteochondromatosis in an early stage.

Key words: Chondromatosis, synovial; Temporo-mandibular joint

Introduction

Synovial osteochondromatosis has been considered a rare benign disorder characterized by the development of metaplastic cartilaginous foci in the synovial membrane of the articular joints. The knee joint is most commonly affected, followed by the hip and elbow in order (Nixon, 1960), while the temporo-mandibular joint (TMJ) is seldom involved. Synovial osteochondromatosis of the TMJ is clinically manifested as a pre-auricular swelling, therefore it is important to distinguish this condition from a parotid tumour (Blankestijin, 1985; Thompson, 1986). In this report plain X-ray, CT, MRI, RI scintigraphy, and aspiration biopsy were used as diagnostic information, and their usefulness is discussed.

In addition, the histological appearance of synovial osteochondromatosis was of great interest because of its cellular atypia (Ballard, 1972; Lomba, 1977; Ronald, 1978; Allred, 1982; Blankestijin, 1985; Bertoni *et al.*, 1991). The histological features of the present case were examined with a light and electron microscope.

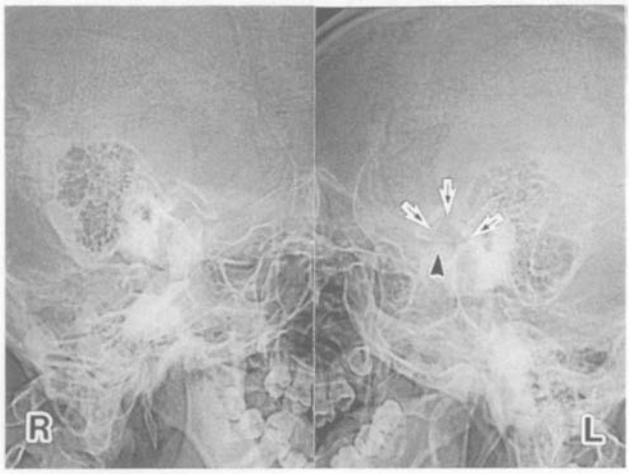

Fig. 1
Radiographs of the TMJ: showing widening of the joint space (arrows) and a lytic lesion of the condyle (arrowhead) on the left side (L).

Case report

A 23-year-old male presented with a 12-month history of left preauricular pain and swelling. No antecedent history of trauma was obtained. Physical examination showed a hard, tender left preauricular swelling, 2 cm in diameter, with a slight restriction in the opening of the mouth.

A radiograph revealed widening of the joint space and a lytic lesion of the left condyle (Figure 1). CT examination showed a 2 × 1 cm tumour mass in front of the left TMJ. There was a low

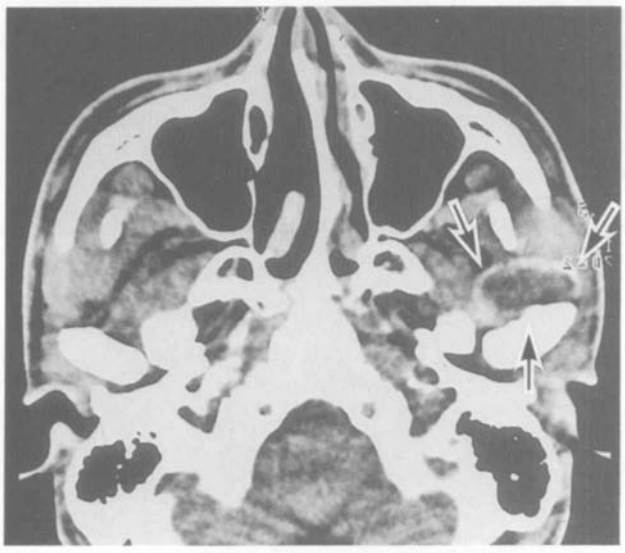

Fig. 2
CT examination showing a 2×1 cm tumour mass (arrows) in front of the left TMJ.

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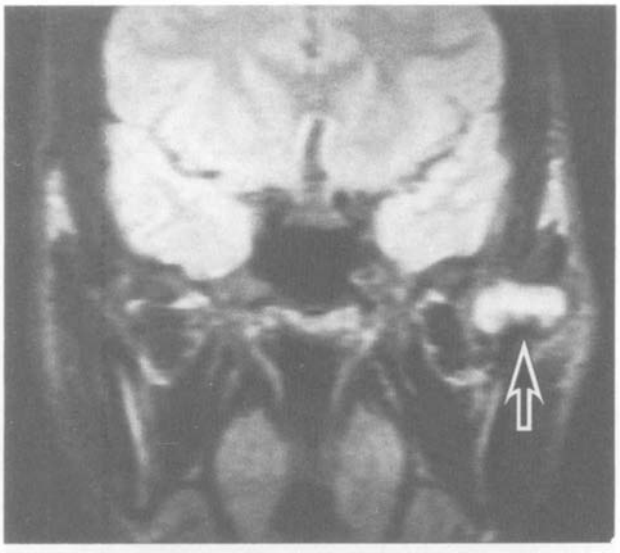

FIG. 3

MRI (T_2 weighted) showing, in a coronal section, a high density tumour (arrow) at the left TMJ.

density area inside the tumour, while a high density area was seen at the periphery of the tumour. There was no obvious invasion of any surrounding tissue (Figure 2). MRI examination (T_2 weighted) showed a high signal intensity tumour at the left TMJ (Figure 3). A technetium 99m bone scan revealed increased uptake in the left preauricular region corresponding to the tumour mass. A garium citrate scan was negative. Aspiration biopsy revealed chondrocyte-like cells in the mucous secretion.

The patient's left TMJ was explored in a manner similar to the total parotidectomy with facial nerve preservation. A cartilaginous mass that appeared to be arising from the synovium of the anteromedial portion of the TMJ was noted. The grey-white tumour showed a lobulated external surface. Detached particles were not present in the joint space. Since the condylar head was partly destructed, a high condylectomy was performed in order to remove the tumour.

Fifteen months after surgery the patient was free from pain and swelling.

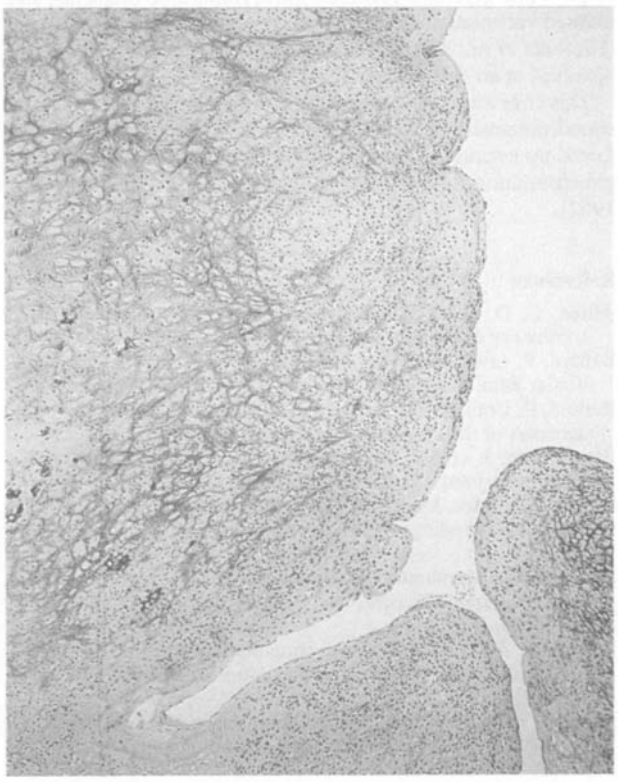

FIG. 4

Osteocartilaginous nodules lying adjacent to the synovial membrane arranged in a lobular pattern with intervening fibrous septa. (H & E ×40).

Microscopical findings

Light microscope examination showed round to irregularly-shaped osteocartilaginous nodules lying adjacent to the synovial membrane in a lobular pattern with intervening fibrous septa. Chondrocytes were evenly distributed, but increased cellularity with spindling of the nuclei was not found. Myxoid degeneration in the matrix or necrosis was not present (Figure 4). The nuclei of the chondrocytes were generally large and hyperchromatic, therefore mild cellular atypia was present in this specimen (Figure 5).

Electron microscope examination showed the mature chondrocytes with many fine cell processes. Cytoplasm contained a well-developed rough endoplasmic reticulum whereas glycogen granules, intracytoplasmic filaments, and marked vacuolation of cytoplasm were scarcely observed. Nuclear pleomorphism was not observed in this area. There were amorphous materials in the cartilage matrix and also calcification around the chondrocytes (Figures 6 and 7).

Discussion

Since synovial osteochondromatosis of the TMJ is infrequently encountered and its chief symptom is the preauricular swelling, the differential diagnosis between a parotid tumour and this condition is important (Blankestijin, 1985; Thompson, 1986). On physical examination the tenderness at the preauricular region and the restriction in opening the mouth suggest that the tumour is associated with the TMJ. Radiographic findings in

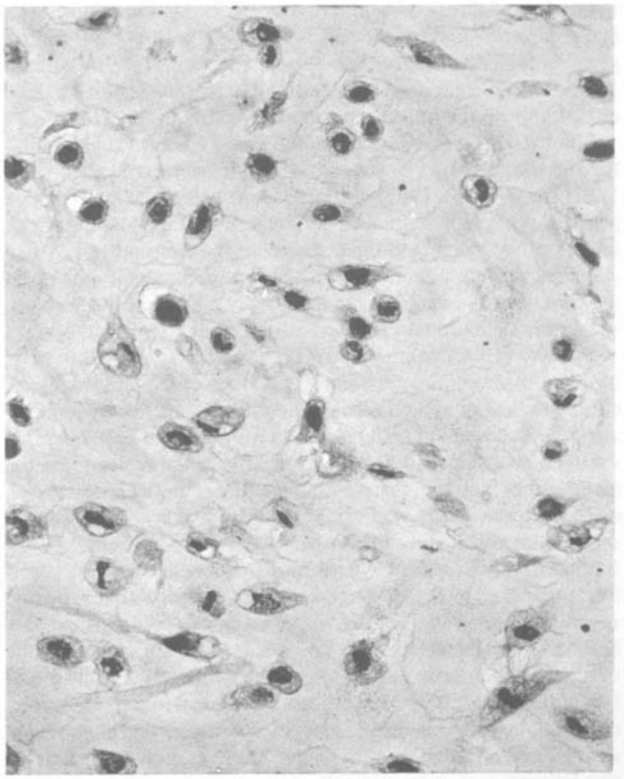

FIG. 5

Nuclei of the chondrocytes shown as large and hyperchromatic (H & E ×400).

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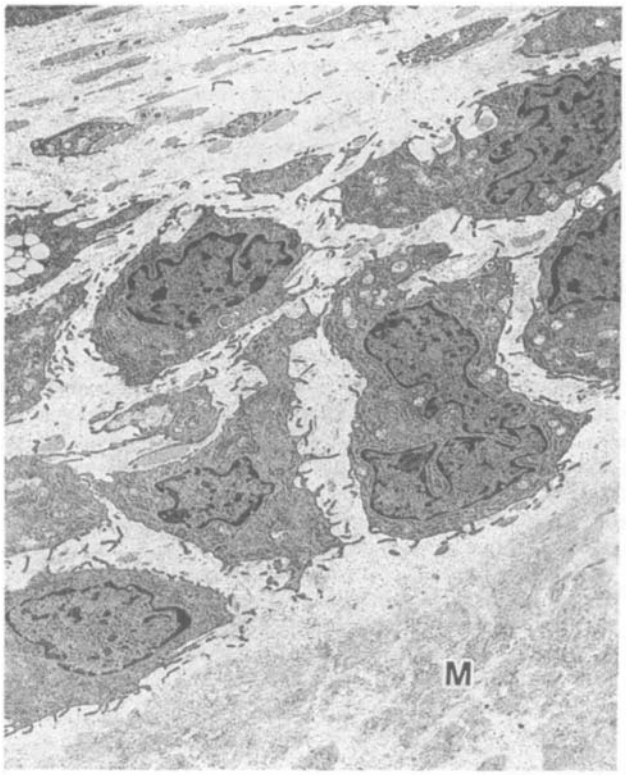

FIG. 6

Chondrocytes showing many fine cell processes arranged in several rows: M is the cartilage matrix.

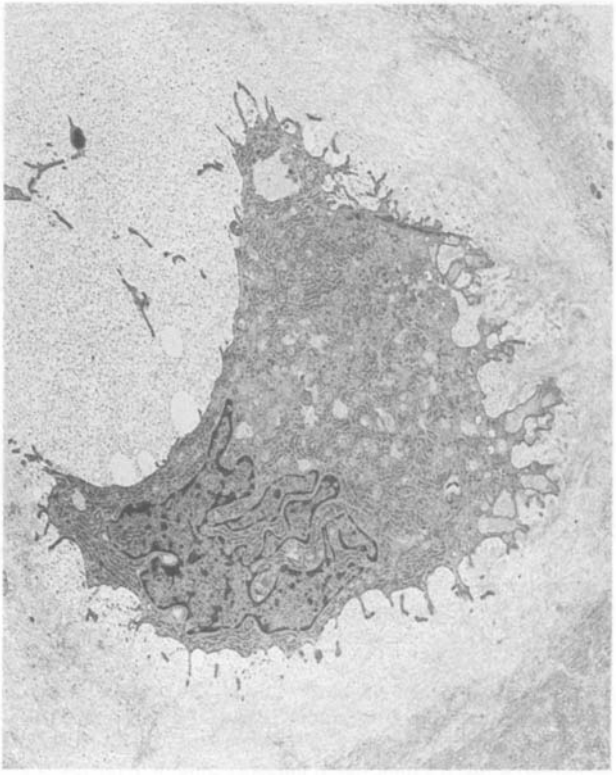

FIG. 7

Mature chondrocytes, located in the lacuna, showing a well-developed rough endoplasmic reticulum in their cytoplasm.

synovial osteochondromatosis of the TMJ, such as widening of the joint space, limitation of motion, irregularity of joint surfaces, presence of calcified loose bodies, and sclerosis or hyperostosis of the glenoid fossa and mandibular condyle were suggestive of this condition (Noyek, 1977). On the other hand, synovial osteochondromatosis of the TMJ with normal radiographic findings has been reported (Schulte, 1969; Ballard, 1972), and in such cases CT and MRI are very useful as they directly reveal the tumour mass associated with the TMJ.

Since it has been reported that the 99m Tc bone scan is useful for the diagnosis of synovial osteochondromatosis (Morrish, 1983; Blankestijin, 1985), the increased uptake of 99m Tc at the preauricular region as in our case suggests that the tumour arises from the TMJ or mandibular condyle. Furthermore when the chondrocytes are obtained by aspiration biopsy, as in our case, the pre-operative diagnosis is tentatively considered to be synovial osteochondromatosis.

Murphy (1962) demonstrated that cellular atypia suggestive of chondrosarcoma were found in 23 out of 32 specimens of clinically benign synovial osteochondromatosis. Many authors also reported that the cellular atypia were present in the benign synovial osteochondromatosis, especially at the active growing lesion, and that the differential diagnosis between synovial osteochondromatosis and chondrosarcoma was difficult only differentiated by the histological findings (Ballard, 1972; Lomba, 1977; Ronald, 1978; Allred, 1982; Blankestijin, 1985; Bertoni *et al.*, 1991). Although large and hyperchromatic nuclei i.e. mild cellular atypia were observed in the present case, the hallmarks characteristic of chondrosarcoma such as myxoid change in the matrix, necrosis, and hypercellularity with spindling of the nuclei (Bertoni *et al.*, 1991) were not found. Therefore mild cellular atypia in the present case were regarded as showing active growth rather than the sign of malignancy. Furthermore the present case was clinically benign, it was diagnosed as benign synovial osteochondromatosis by histological and clinical evaluation.

The ultrastructural features of synovial osteochondromatosis i.e. chondrocytes showing well-developed Golgi apparatus and a rough endoplasmic reticulum proliferate in clusters at an early stage; while glycogen granules, intracytoplasmic filaments, and marked vacuolation of cytoplasm are seen at an advanced stage (Hirohata *et al.*, 1981). The present case was ultrastructurally observed at an early stage.

This case was considered to tbe typical benign synovial osteochondromatosis. Nevertheless the patient will be carefully followed up because of the possibility of recurrence or malignant transformation to chondrosarcoma (Nixon, 1960; Murphy, 1962).

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