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CASE REPORT

Ossifying parosteal lipoma of the mandible: a case report and review of the literature

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Parosteal lipoma is an unusual kind of lipoma and occurs in intimate association with the underlying periostium of the bone. Parosteal lipomas mostly affect the long bones and involvement of the mandible is rare. We report a case of ossifying parosteal lipoma of the mandible in which CT was effective in diagnosis and showed a well-circumscribed mass of fat attenuation containing areas of ossification and branch-like bony protuberances from adjacent cortical bone. Microscopic examination revealed that the mass was composed of mature fat cells without nuclear hyperchromasia or atypia. Layers of bone and ossification were found inside. Although rare, it should be considered as a differential diagnosis of teratoma, osteochondroma and osteosarcoma.
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Case report

History and clinical examination

A 48-year-old male was referred to our hospital because of a slow-growing mass on his chin which had been present for at least 20 years with associated occasional numbness of the right lower lip. The patient's general health was good and no other remarkable medical history could be elicited.

A mass of approximately $8 \times 6 \times 5$ cm in dimension was palpable beneath the skin of the chin and mental areas extending bilaterally to the buccal areas. The mass was soft, non-tender and fixed to the mandible. No prominent swelling, hyperaemia or ulceration of the skin was seen. No mouth opening difficulty was noted. Intraoral examination showed that the buccogingival sulcus was shallower and the mucosa was intact. No prominent loosening of the mandibular teeth was noted.

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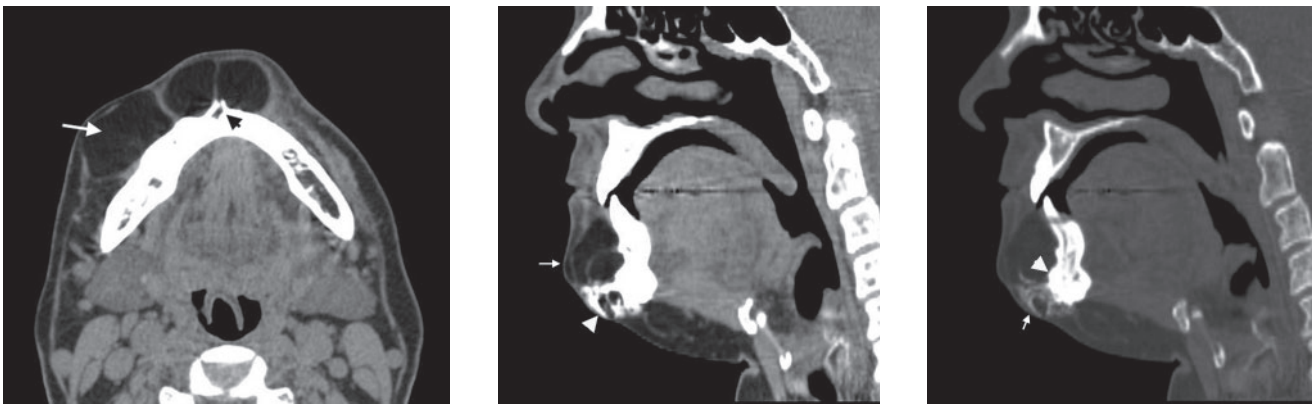
Radiographic examination

A panoramic radiograph failed to find any major bony changes of the mandible. CT revealed a broad-based, well-demarcated mass with fat attenuation beneath the skin (Figure 1a). Areas of ossification were prominent inside the mass (Figure 1b). Exophytic osseous protuberance and branch-like periosteal thickening from the underlying symphysis of the mandible were identified (Figure 1a,c). The cortical bone was uneven and was locally infiltrated or depressed. The marrow space of the mandible was not contiguous with the lesion and sclerosis of the trabeculae was seen.

Surgical treatment

En bloc resection of the mass together with the osseous protuberance from the mandible was performed. The mass was well circumscribed and was easily dissected from the adjacent soft tissue. The base of the tumour adhered strongly to the underlying mandible. The mass measured $7 \times 5 \times 5$ cm and was well encapsulated by a thin, fibrous membrane. The cut surface of the specimen was yellowish with a mostly homogeneous appearance. Hard bony protuberance from the underlying mandible was chiselled and the bone was shaped.



a b c

Figure 1 (a) Axial CT image (window level 50, window width 300) demonstrates a well-circumscribed lobular mass (white arrow) of fat attenuation (CT value of approximately –100 HU) with multiple fibrous septa, lying adjacent to the cortex of the mandible. Note that the outline of the cortex is uneven and undulating. Local branch-like protuberance of the cortical bone is seen (black arrow). (b) Sagittal view of soft tissue (window level 50, window width 300) shows the mass (white arrow) contained an irregular area of ossification (arrowhead). (c) The adjacent cortex (arrowhead) is thickened and the surface is coarse in the bony view (window level 250, window width 2000), and note the irregular ossification (white arrow) inside the tumour

Histological examination

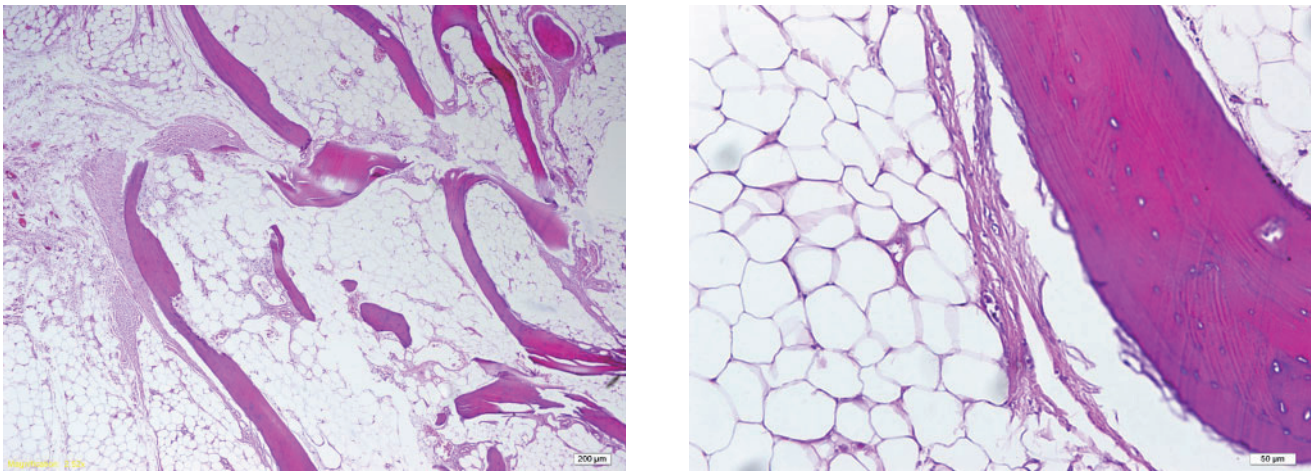
Microscopically, the mass was mostly composed of mature adipocytes and scattered layers of mature bone foci were seen (Figure 2a). None of the major components showed any nuclear pleomorphism or immaturity (Figure 2b), thus the diagnosis of ossifying parosteal lipoma was confirmed.

Discussion

Lipoma is a benign tumour composed mainly of mature adipose tissue.[1] Lipoma can be classified into superficial lipoma, deep lipoma, intramuscular or intermuscular lipoma, and osseous lipoma according to the classification of the World Health Organization in 2002.[1] Although lipomas represent by far the most common mesenchymal neoplasm, osseous lipomas are rare and mostly involve the femur, radius, humerus, tibia, fibula, clavicle and pelvis.[2–5]

Lipomas can occasionally have areas of abundant fibrous tissue, myxoid changes, cartilage or bone formation.[1] Osseous lipoma is unusual, accounting for approximately 0.3% of all kinds of lipoma.[6] Intraosseous, cortical or parosteal lipomas have been described based on their relation to the parent bones.[7–9] To the best of our knowledge, this is the second case of parosteal lipoma of the mandible documented in English-language literature, with the other case reported by Steiner in 1981.[10]

The parosteal lipoma exhibits a contiguous relationship with the periosteum and usually demonstrates some form of attachment to the periosteum with



a b

Figure 2 (a) Low-power view photomicrograph (×40) reveals that the tumour is composed of mature fat tissue with scattered layers of bone tissues (haematoxylin and eosin staining). (b) High-power view shows mature fat cells varying in celluar size and shape without nuclear hyperchromasia. Bone tissue can be seen with osteoblasts inside (×200)

underlying osseous reaction.[7–10] Parosteal lipoma may rest directly on the cortex with or without cartilage or bone elements inside. Approximately 60% of all parosteal lipomas had definite bony alterations of the parent bones. Ossification or reactive processes such as bony hyperostosis, protuberance, erosion and compressive changes may be present.[7,11] Branch-like or linear cortical protuberances and ossification are frequently seen. Cortical depression, thickening, undulation or smooth erosion may also be present. Aggressive bone destruction is consistently absent.[7]

Clinically parosteal lipomas are usually asymptomatic lesions but motor or sensory function deficits may be caused if nerve bundles are compressed by the lesions.[12–14] Occasional numbness of the lower lip had been noted by the patient in the present case, which may be due to the compression and displacement of the mental nerve caused by tumour expansion.

A tumour with both fat and osseous components inside may be easily considered as teratoma. However, in this case the osseous component showed a close relationship with the cortex of the mandible, which should be considered as reactive or secondary changes. Exophytic osseous components from the cortex of the mandible may also be mistaken for an osteochondroma, osteoma osteosarcoma or chondrosarcoma. These tumours usually present without surrounding fat components. If spiculated periosteal new bone formation with an ill-defined border is present, osteosarcoma should be considered, which is absent in this case.

CT is effective and reliable in the diagnosis of parosteal lipomas. The most characteristic feature demonstrates a well-defined fat attenuation mass adjacent to the cortical bone and reactive changes in the underlying cortex. Morphologically, parosteal lipomas usually present a homogeneous lobulated appearance and are adherent to the surface of the adjacent bone.

The treatment of parosteal lipoma is complete surgical resection. Dissection of a soft-tissue lipoma or parosteal lipoma lying adjacent to the bone is not difficult. However, in the circumstance of parosteal lipoma with a close relationship to the bone, adequate surgical excision necessitates subperiosteal dissection, osteotomy or segmental resection of the bone to separate the lesion from the underlying bone. Local recurrence is rare and malignant changes have not been documented previously.

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