Maxillofacial fibrous dysplasia: personal experience with gadolinium-enhanced magnetic resonance imaging

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Abstract
Purpose. The authors sought to identify radiological criteria assisting in the diagnosis of craniofacial fibrous dysplasia and differential diagnosis of fibro-osseous lesions by comparing computed tomography (CT) and magnetic resonance imaging (MRI) findings and histological results in 23 patients with presumed fibrous dysplasia.

Materials and methods. From February 2000 to March 2005, 23 patients (17 women and six men, aged 9–66 years) with facial bone disease underwent CT and MRI studies. Imaging findings were compared with the results of histological examination performed within 1 month of the radiological diagnosis.

Results. The combination of CT and MRI led to a presumptive diagnosis of fibrous dysplasia in all cases, but histology confirmed the diagnosis in 18 cases only. In two cases that had initially been considered cyst-like variants of fibrous dysplasia and were associated with irregular enhancement at MRI, histology characterised the lesions as single locations of multiple myeloma. In one case, targeted biopsy of areas showing intense enhancement led to a diagnosis of low-grade fibrosarcoma; in the remaining two cases, the definitive diagnoses were ossifying fibroma and myeloproliferative disease.

Conclusions. MRI proved useful in differentiating fibrous dysplasia from other bone diseases, defining clinical behaviour, identifying neoplastic foci within dysplastic tissue and distinguishing benign from malignant bone lesions. The authors suggest a broader use of contrast-enhanced MR imaging in the evaluation of craniofacial fibrous dysplasia.

Riassunto
Obiettivo. Lo studio si propone di confrontare i reperti di TC e RM di 23 pazienti presumibilmente affetti da displasia fibrosa con i risultati dell’indagine istologica, definendo criteri radiografici utili nella diagnosi della displasia fibrosa craniofacciale e nella distinzione delle lesioni fibro-ossee da altre patologie ossee, con particolare rilievo per la RM con mezzo di contrasto.


Risultati. L’integrazione TC-RM ha permesso di ipotizzare la diagnosi di displasia fibrosa nei casi selezionati, ma l’esame istologico ha confermato la diagnosi solo in 18 casi; in 2 casi, inizialmente ritenuti varianti simili istologiche della displasia fibrosa ed associati ad un enhancement irregolare rilevabile all’esame RM, l’istologia ha definito le lesioni come localizzazioni uniche di mieloma multiplo. In 1 caso l’esecuzione di prelievi bioptici a livello di aree di intenso enhancement ha condotto alla diagnosi di fibrosarcoma di basso grado e nei 2 casi restanti si è giunti alle diagnosi definitive di fibroma ossificante e di patologia mieloproliferativa.

Conclusioni. La RM si è rivelata utile nella diagnosi differenziale tra la displasia fibrosa ed altre affezioni del tessuto osseo, nella definizione del suo comportamento.
enhanced MRI for the diagnosis and follow-up of dysplastic lesions of the facial bones and for planning appropriate surgical treatment.

**Keywords** Polyostotic fibrous dysplasia · CT · MRI

**Introduction**

Fibro-osseous lesions of the facial bones represent a group of lesions characterised by replacement of normal bone with a cellular fibrous matrix containing foci of irregular mineralisation of varying amounts and appearance. Classification, diagnosis and treatment of such lesions are very complex, not only because of a lack of agreement about terminology but also because of a significant overlap in histological features [1]. Fibrous dysplasia (FD) is a benign developmental disease of bone of unknown origin in which there is replacement of the normal trabecular bone and filling of the medullary cavity of affected bones by abnormal fibrous tissue containing trabeculae composed of poorly calcified bony tissue [2–4].

Reports published over the last 40 years have shown considerable difficulties in classifying and differentiating fibro-osseous lesions owing to a lack of any universally accepted clinical, radiological and histological criteria capable of differentiating FD from ossifying fibroma and other forms of bone dysplasia [3, 5]. For this reason, diagnosis and differentiation of the various disease entities must still rely on the correlation of clinical, radiological and histological findings [6]. It is often very difficult to define a typical clinical behaviour for each fibro-osseous lesion and establish whether it is neoplastic, dysplastic or reactive in nature [3].

Computed tomography (CT) or magnetic resonance imaging (MRI) findings vary widely depending on the prevalence of fibrous or bony components [4, 7]. The use of these techniques alone is thus inadequate for differentiating among the various entities, requiring correlation with the clinical findings and ultimately a biopsy for the final diagnosis.

The aims of this study were to compare CT and MRI findings with the histological results in 23 patients with a presumptive diagnosis of FD based on the clinical features and to define imaging criteria helpful in diagnosing craniofacial FD and distinguishing fibro-osseous lesions from bone disease, with special reference to gadolinium-enhanced MRI.