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Case report

Focal seizures secondary to cortical dysplasia associated with isolated oral morphea and odontogenic carcinoma

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1. Introduction

This report describes a constellation of unusual conditions associated with oral morphea in a young man. The patient had oral linear morphea later associated with an underlying odontogenic carcinoma. The tumour was successfully resected. A year later, following loss of consciousness, a CT brain showed calcification in the left temporo-parietal cortex. MRI brain showed three independent abnormalities, surrounded by variable amounts of oedema, deep within the white matter of the left temporal, frontal and parietal regions without enhancement with gadolinium. Biopsy samples revealed cortical disarray with large neurons, necrosis and calcification. We describe the first case of odontogenic carcinoma, cerebral calcification and cortical dysplasia in a young man with oral morphea.

2. Case report

The patient is a 25 year-old, right-handed, male, civil engineering student. Aged 16 he had a two month history of bleeding from a white patch on the inner left upper lip and alveolus. This patch was biopsied and lichen sclerosis et atrophicus was diagnosed. This was later revised to linear morphea following dermatologic assessment and correlation with histology. He was treated with weekly oral methotrexate and pulse steroids (Fig. 1) for two years and his morphea resolved with notching and thinning of the upper lip.

Aged 19, he developed loose, left, upper incisors and underwent dental extraction and biopsy. Histology revealed a small but definite focus of odontogenic carcinoma and imaging demonstrated an isolated localised lesion with poor boundaries. The lesion was excised with clear margins and a dental plate was inserted.

A year later he had sudden-onset of speech disturbance whilst cycling followed by loss of consciousness and a secondarily generalised convulsion. It emerged that he had four previous episodes of transient speech arrest and altered awareness between the ages of 14 and 20. A clinical diagnosis of localisation related epilepsy was made and carbamazepine was commenced. This controlled the events.

Past medical history included pyloric stenosis as a child. He was a non-smoker and consumed 8 units of alcohol per week. His paternal grandfather had carcinoma of the jaw and his father's paternal first cousin died in his 50s of a glioblastoma.

Physical examination demonstrated a white, sclerotic plaque on the left upper mucosal lip with an associated maxillary alveolar defect. The maxillary defect is reconstructed with a dental prosthesis. There was a transverse laparotomy scar in the right upper quadrant.

CT brain showed calcification in the left temporo-parietal cortex. MRI brain showed three independent abnormalities in a linear arrangement dorsal to caudal, surrounded by variable amounts of oedema deep within the white matter of the left temporal, frontal and parietal regions. The lesions gave a low signal on T1 weighted images and there was no enhancement with gadolinium. CSF exam and EEG were unrevealing. Repeat MRI after four months showed increased size of one of the left parietal lobe lesions with increased vasogenic oedema. An autoantibody screen was negative and a skeletal survey was normal (Fig. 1). A left deep white matter parietal lesion was excised.

Tissue removed at biopsy from the left parieto-occipital cortex and underlying white matter were stained with Haematoxylin & Eosin, Luxol Fast Blue/Nissl, von Kossa, Perls Prussian Blue, Congo Red and immunostained using antibodies to glial fibrillary acidic

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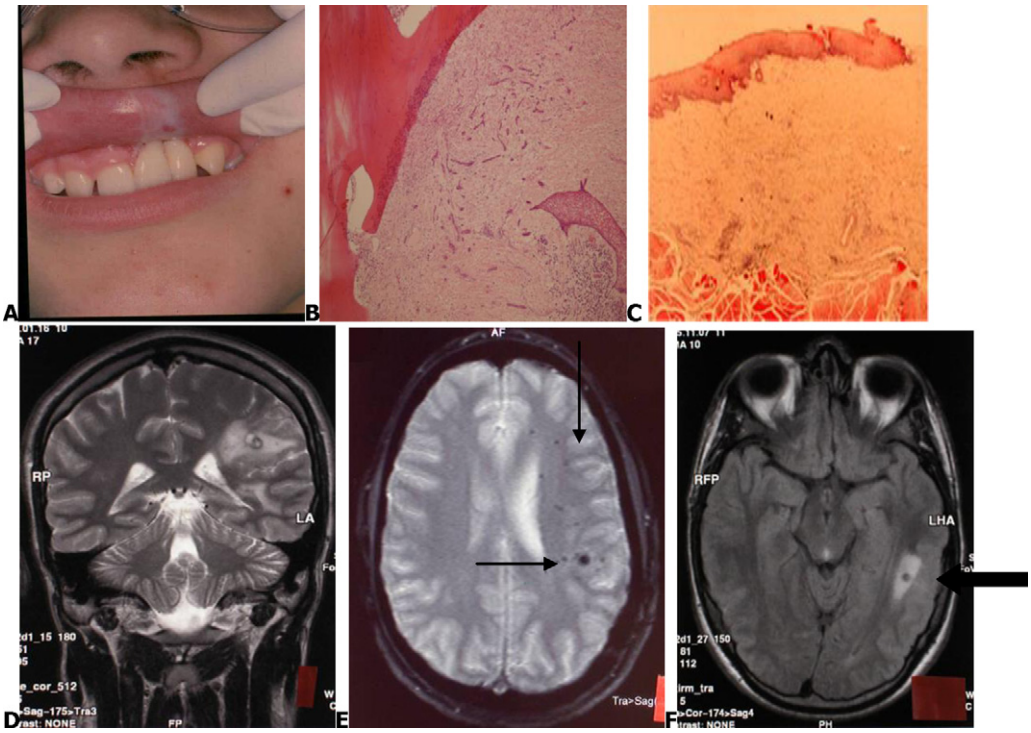

Fig. 1. (A) Linear morphea of left upper lip. (B) H&E stain of an oral biopsy shows bone on left with proliferation of epithelial islands in periodontal stroma. The epithelium, while very bland, is very disordered and infiltrative with perineural invasion consistent with an odontogenic carcinoma. (C) Pale sclerotic stroma in a band below the epithelium with some residual inflammation at the lower edge of the band. (D) Coronal MRI image demonstrating the linear nature of the frontoparietal lesions. (E) Gradient ECHO MRI sequence showing susceptibility artefact and again demonstrating the linear nature of this patient's lesions. In this patient these represent calcifications as confirmed on histopathology. (F) Axial MRI image demonstrating a lesion in the left temporo-parietal region with overlying grey matter abnormality as compared to the right temporo-parietal cortex.

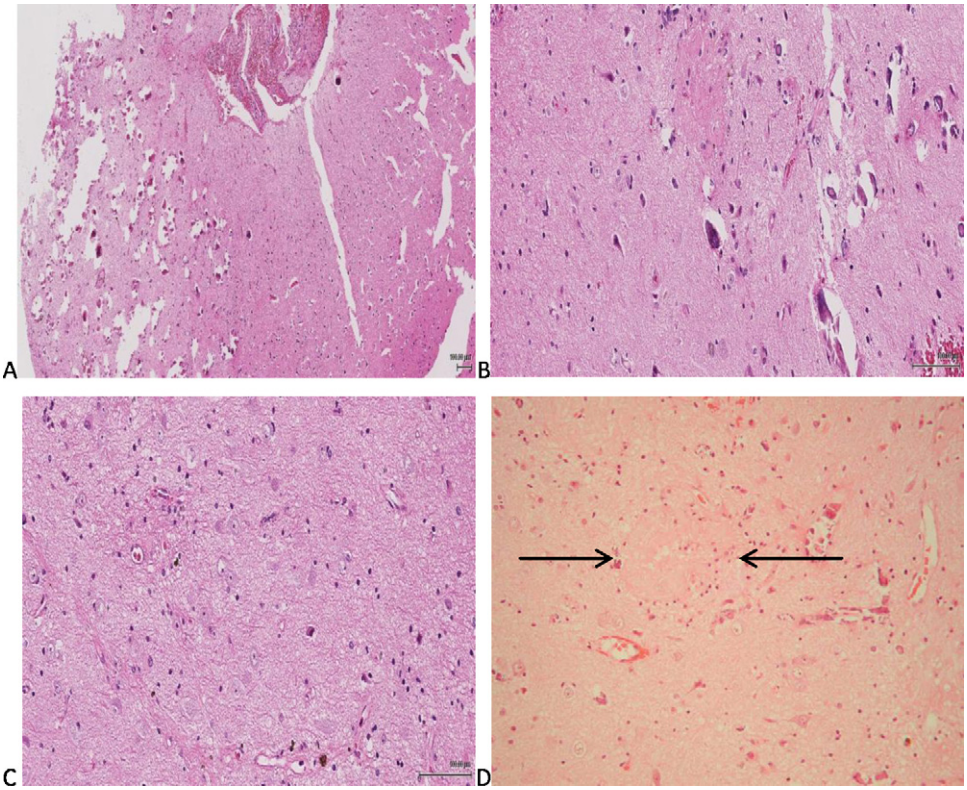

Fig. 2. (A) Highly calcified cortex nodule (Haematoxylin & Eosin). (B and C) Cortex showing lack of laminar architecture and maloriented neurons (Haematoxylin & Eosin). (D) Circular plaque like area devoid of cells (arrowed).

protein (GFAP), Ki-67 and synaptophysin. Microscopy showed a malformed cortex with abnormally-orientated large neurons, not arranged in a normal laminar pattern. There were no ballooned neurons. The area was calcified with deposits both within blood vessels and also in brain parenchyma. Astrocytic gliosis of the grey matter was also seen. Round unusual foci devoid of cells resembling plaques or necrosis were also present and there was haemosiderin deposition. There was no tumour and the appearances did not resemble leucoencephalopathy or effects of radiation. The appearances were not typical of ganglioglioma and were interpreted as cortical dysplasia with unusual calcification (Fig. 2).

3. Discussion

The classification of morphea is based on clinical phenotype and includes circumscribed, linear, generalised, pansclerotic and mixed variants.[1] It can cause sclerosis of all mesoderm-derived tissue.[2] The incidence of morphea has been reported as 0.4–2.7 per 100,000 people.[3,4] The aetiology of morphea is not fully understood but it is associated with a family history of autoimmunity[5] and triggers may include trauma, medications and viral infections.[2] It is more common in females with a ratio of 4.2:1 and there is almost equal prevalence in adults and children. Children, however, more commonly develop linear morphea,[5] which is also known as linear scleroderma and is a localised fibrosing disorder. Linear morphea presents with linear plaques involving the dermis and sometimes the subcutaneous tissues. Linear morphea on the paramedian forehead is called en coup de sabre. Parry Romberg syndrome or progressive hemi facial atrophy (PHFA) is still poorly understood but is thought to be a form of deep morphea. These patients develop atrophy of the subcutaneous tissues (fat, muscle and bone) and very rarely have epidermal changes.

Neurological complications of linear morphea include seizures, trigeminal neuralgia, migraine, intracranial aneurysms, hemiparesis, Rasmussen encephalitis and cranial nerve palsies.[6,7] Cerebral calcification has been described radiologically in patients with linear scleroderma, including en coup de sabre, and in patients with PHFA,[8] but it has not been described previously in association with oral morphea.

Previous brain biopsy reports have shown inflammatory changes as well as sclerosis.[9] An underlying inflammatory aetiology, amenable to immunosuppression, has, therefore, been suggested.[10] There are no reports of biopsy-proven cortical dysplasia in patients with linear sclerosis in the literature. There is one report of cortical dysplasia seen on MRI brain underlying a patient's en coup de sabre lesion.[11] We are interpreting the cortical lesion described in the patient presented here as representing unusual cortical dysplasia with calcification and as being related to linear morphea.

Oral complications include tongue atrophy, altered dentition and malocclusion.[7] There have been no previous reports of odontogenic carcinoma associated with linear morphea. While it could be argued that the presence of the odontogenic carcinoma excited a morphea-like reaction in the overlying mucosa, the morphea lesion was present for a long period prior to the development of a small odontogenic carcinoma and this sequence of events makes that very unlikely.

This case is remarkable for three reasons; the association of cerebral calcification with oral morphea, the occurrence of odontogenic carcinoma underlying oral morphea and the presence of cortical dysplasia on brain biopsy in a patient with oral morphea. It reinforces the importance of a full skin and oral examination in patients presenting with unexplained neurological disease.[7]

Conflict of interests

None of the authors have any conflicts of interest to disclose.

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