Atrial myxoma: a cardiocutaneous syndrome

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INTRODUCTION

Atrial myxomas are the most common primary cardiac tumour, but a rare cause of stroke. Occasionally, atrial myxomas are the presenting feature of a more generalized cardiocutaneous syndrome, known as 'Carney complex' (CNC). This article presents a case report with this genetic syndrome and reviews management of such individuals.

DISCUSSION

The combination of neurofibromas and atrial myxomas suggests the diagnosis of the cardiocutaneous NAME syndrome (nevi, atrial myxomas, myxoid neurofibromatomas, ephelides (freckles) and endocrine neoplasia), which is now subsumed into the CNC (multiple endocrine neoplasia, spotty skin pigmentation, and myxomas). CNC was first described by Carney in 1985 and there are now several hundred individuals worldwide with the diagnosis. The endocrine disorders include primary pigmented nodular adrenocortical disease (PPNAD) giving rise to Cushing syndrome, thyroid, breast, and gonadal tumours as well as acromegaly resulting from non-growth hormone-releasing hormone-dependent somatomammotroph hyperplasia or adenoma. There was no evidence of endocrine disorders in this patient. CNC is an autosomal dominant disorder, with a gene locus having been identified on chromosomes 17q22-242 (PKAR1A) and 2p16 (Stratakis et al, 1996), although other loci may be involved. The diagnostic criteria are shown in *Table 1*.

Myxomas presenting as part of CNC are more likely to recur (Waller et al, 1989) and lifelong surveillance with echocardiography is advised. One study has suggested that sporadic myxomas do not share the same genetic aetiology (Fogt et al, 2002). Currently it is recommended that patients with previously diagnosed myxomas, especially children with CNC, undergo echocardiography every 6 months, whereas patients with CNC and no known history of myxomas should have an echocardiogram no more frequently than once a year. This is because recurrent myxomas tend to be rapidly growing and may require more frequent surveillance in order to be detected early – in one case, a recurrent tumour was detected just 4 months after initial surgery (Mertl et al, 1987); in another case, the myxoma recurred after 10 months and had already metastasized (Hou et al, 2001).

CASE REPORT

A 52-year-old man presented with recurrent transient ischaemic attacks (TIA), predominantly causing visual disturbance. In the past he had suffered from migraine and had a horseshoe kidney on the right. Additionally, he had previously undergone surgery for several skin lesions (*Figures 1a* and *b*) that were myxoid or called 'neurofibromas', although he did not have any cafe-au-lait patches or axillary freckling and no clear family history to suggest neurofibromatosis.

He underwent echocardiography to investigate the cause of his TIAs, which revealed a 3 cm mass attached to the junction of the inter-atrial septum and the annulus of the anterior leaflet of the mitral valve (*Figure 2*). The echocardiogram was otherwise normal, as was subsequent coronary angiography. Surgery revealed three masses: the first as documented by echocardiography, the second similar mass was located at the entrance of the right pulmonary veins and the third, smaller mass was also close to the mitral valve (*Figure 3*). All were completely excised and the atrial wall repaired. The recovery was uncomplicated. Histology confirmed that all three masses were completely excised atrial myxomas.

TABLE 1.
Diagnostic criteria for Carney complex

Spotty skin pigmentation with a typical distribution (lips, conjunctivae, inner or outer canthi, vaginal and penile mucosa)
Myxoma (cutaneous and mucosal)
Breast myxomatosis
Primary pigmented adrenocortical disease
Acromegaly as a result of a growth hormone-secreting tumour
Large-cell calcifying Sertoli cell tumour
Thyroid carcinoma
Psammomatous melanotic schwanoma
Blue naevus, epithelioid blue naevus
Breast ductal adenoma
Osteochondromyxoma
Additional criteria include an affected first degree relative and/or an inactivating mutation of PKAR1A gene. The diagnosis can be made on the basis of two of the main criteria or one main and one additional criterion
Adapted from Stratakis et al (2001)

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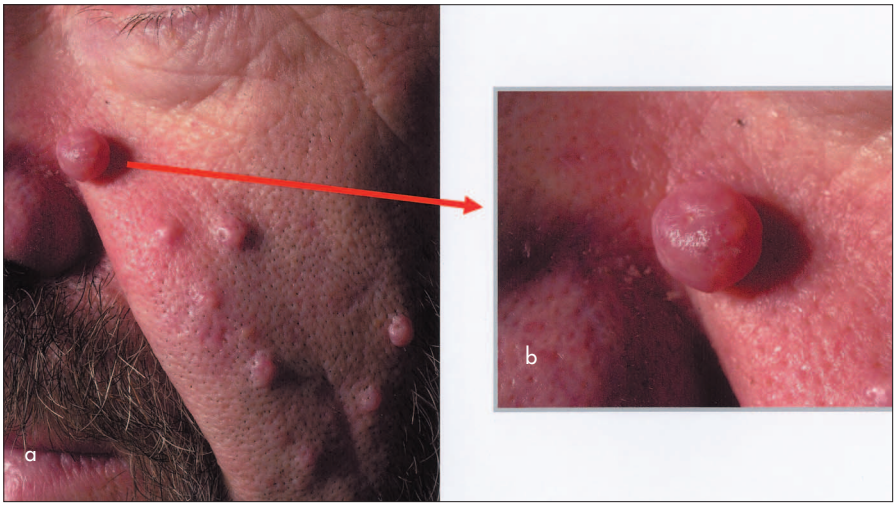

Figure 1. a. Neurofibromatous facial lesions. b. Close-up view of the neurofibromatous facial lesions.

Reports suggest that young men with atrial myxomas are more likely to present with neurological features and emboli (Pinede et al, 2001). This is in contrast to the 'connective tissue syndrome' (including weight loss and fever) that may be a presenting feature of sporadic atrial myxomas. Constitutional and connective tissue symptoms are related to secretion of interleukin (IL); high levels of IL may also predict tumour recurrence (Mendoza et al, 2001). However, so far, elevated levels of IL have not been shown in patients with cardiac myxomas associated with CNC (CA Stratakis, S Bornstein, A Lotsikas, DA Papanicolaou, unpublished data, 1998).

The operative findings may also help distinguish sporadic myxomas from the rarer familial type discussed here. Sporadic myxomas are single in over 90% of presentations and arise from the septum, usually on the left atrial side. In this patient, the presence of multiple tumours arising from the atrial wall and mitral valve was very unusual and highly suggestive of a familial complex.

There should be a low threshold for using transoesophogeal echocardiography in high-risk patients or conventional transthoracic echocardiography if there are poor views (Waller et al, 1992). Surgical excision should be arranged as soon as the diagnosis is made.

A high index of suspicion is required to identify co-existent pathologies of CNC. Initial screening of family members should be with a historical search for endocrine symptoms, clinical examination for cutaneous lesions, and if possible, genetic screening which should allow the identification of non-carriers, who do not need follow up. Screening for the endocrine components may include a dexamethasone suppression test (for PPNAD), testicular ultrasound for gonadal lesions, prolactin, growth hormone and/or insulin-like growth factor-1 assays for pituitary lesions, thyroid ultrasound and breast imaging. **HM**

Figure 2. Transthoracic echocardiogram revealing a 3 cm mass at the interatrial septum.

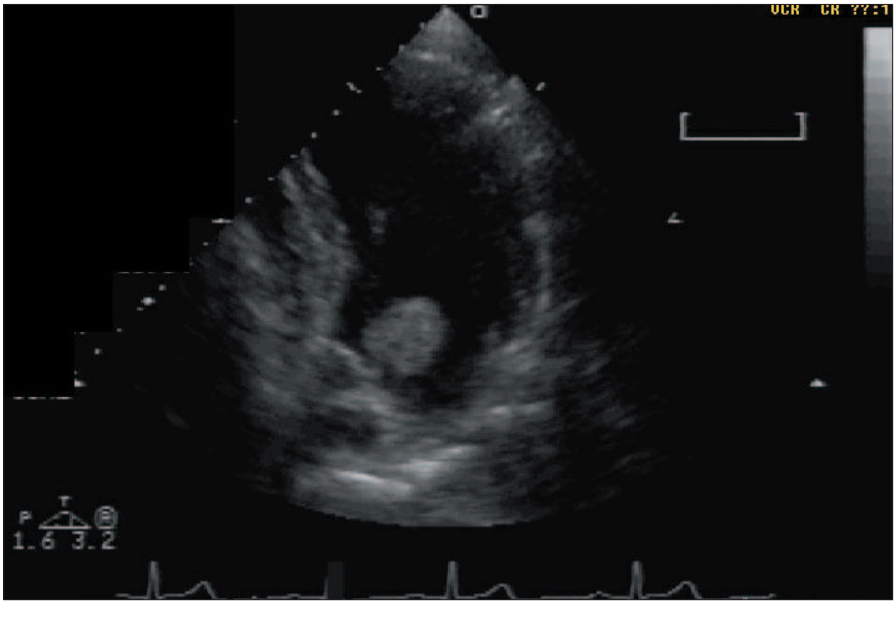

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Figure 3. Findings at surgery of a patient with multiple atrial myxomas.