Lipomatosus hypertrophy of the interatrial septum: an unusual intraoperative finding

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Abstract
Lipomatosus hypertrophy of the interatrial septum was an incidental finding in a man of 45 undergoing coronary artery bypass grafting for unstable angina. He was not overweight and did not have any rhythm disturbances. The diagnosis was made on frozen section.

Case report
A 45 year old man presented in August 1989 to the National Cardiac Surgical Unit, Dublin with unstable angina that required emergency grafting.

In August 1988 he had had an inferior myocardial infarction from which he made an uneventful recovery but was left with angina of effort. This remained stable on medical treatment. Two months before operation the angina became unstable and angiography confirmed triple vessel disease. He was a moderately heavy smoker with a family history of ischaemic heart disease: his father died at the age of 51 from a myocardial infarction. Forty eight hours before operation he was admitted to a coronary care unit. He needed intravenous nitrates to control his angina.

He looked fit and was normotensive and in sinus rhythm. There was no evidence of congestive heart failure. He had varicose veins in both legs.

Laboratory investigations were normal except for total proteins (85 g/l (normal range 58–80)); albumin (54 g/l (35–53)); and alanine aminotransferase (45 IU/l (5–35)). The electrocardiogram showed sinus rhythm.

Within hours of his transfer to our unit a coronary artery bypass graft operation was started. Total cardiopulmonary bypass was established through a single aortic cannula and a composite venous cannula after a median sternotomy. Then a lesion of the interatrial septum in front of the right superior pulmonary vein was noticed. At this point bicaval cannulation was carried out and the right atrium was opened to show a firm brownish mass in the interatrial septum.

The mass was regarded as a possible tumour and multiple biopsy specimens were taken for rapid diagnosis from frozen sections to exclude malignancy. Because the appearance of the specimens suggested lipomatous hypertrophy of the interatrial septum we proceeded to do the coronary artery bypass grafting. Before we closed the right atrium we took further biopsy specimens for paraffin sectioning. We used reversed long saphenous vein segments for bypass grafting to the left anterior descending, right coronary, and obtuse marginal arteries.

He came off bypass with no problems other than a transient nodal rhythm which did not affect his haemodynamic state. After operation he remained in sinus rhythm and his remaining hospital stay was uncomplicated.

A paraffin section of the biopsy specimen (figure) showed fragments of normal myocardium infiltrated by mature adipose tissue which surrounded large and small groups of myocytes. The adipose cells were normal and there was no evidence of malignancy. The epicardium contained occasional clusters of lymphocytes. These features are characteristic of lipomatous hypertrophy of the interatrial septum.

Discussion
This is the second case of lipomatous hypertrophy of the interatrial septum detected as an incidental finding at operation. The first was reported by McAllister and Fenoglio in 1978. We believe that this is the first time this tumour-like lesion has been diagnosed by frozen section examination. Accurate histological diagnosis is not difficult if the possibility of lipomatous hypertrophy is borne in mind. Otherwise a low grade liposarcoma is likely to be diagnosed. A firm brown tumour arising in the interatrial septum in a previously fit young man with earlier evidence of arrhythmia certainly did not suggest lipomatous hypertrophy of the interatrial septum. So it was only after it was unequivocally shown that there was no evidence of malignancy in the frozen sections that we continued with bypass grafting.

Lipomatous hypertrophy of the interatrial septum was first reported by Prior in 1964 as an unusual necropsy finding in five patients (mean age 73). Cases have been reported in patients aged 22 to 88 years. In 1971 Hutter and Page reported on the clinicopathological findings in 10 patients and recognised the high incidence of atrial arrhythmias and a deformed P wave on the electrocardiogram (previously described as a “dome and dip” configuration). When we reviewed our patient’s past electrocardiograms we found similar P wave characteristics in leads II, III, and aVF in electrocardiograms recorded on
two occasions before his transfer to us. Such a
deformed P wave pattern on an electrocardio-
diagram is often associated non-specifically
with atrial enlargement and in our patient
because there was no evidence of atrial
enlargement it should perhaps have alerted us
to the possibility of lipomatous hypertrophy
of the interatrial septum.

In 1982 the first report of lipomatous
hypertrophy of the interatrial septum in a live
patient appeared.\(^5\) This was diagnosed by
computed axial tomographic scanning and the
pattern of fat deposition was shown. The fat
was distributed in a bilobed manner about the
fossa ovalis, which itself was spared. The fatty
nature of the lesion was apparent from the
characteristic Hounsfield number. The
cephalus mass of fat was continuous with the
subepicardial adipose tissue. Isner et al went
so far as to suggest that in an obese, elderly
patient with supraventricular arrhythmias in
whom the cause cannot be identified
lipomatous hypertrophy of the interatrial sep-
tum should be suspected. Had we suspected
lipomatous hypertrophy of the interatrial sep-
tum in our patient cross sectional echocar-
diography would have given us a pre-
operative diagnosis. Pyke et al suggested the
following guidelines for making the diagnosis
on echocardiography: (a) the characteristic
bilobed appearance of the atrial septum when
the beam is directed through the region of the
fossa ovalis; (b) a thickness of \(\geq 15\) mm
postero-superior or antero-inferior to the
valve of the fossa ovalis; (c) the absence of any
other, more likely explanation for septal thick-
ening.\(^6\) They also add that the presence of P
wave abnormalities such as increased voltage
duration or notching supports the diag-
nosis. Accumulation of septal fat where there
is internodal atrial myocardium probably
accounts for the reported arrhythmias and P
wave configuration.\(^7,8\) Applegate et al also
reported two patients with lipomatous hyper-
trophy of the interatrial septum in whom
magnetic resonance imaging was done.\(^8\) We
know of only one patient in whom lipomatous
hypertrophy of the interatrial septum was
associated with multiple subcutaneous
lipomas.\(^10\) On the other hand, cardiac lipomas,
encapsulated masses of mature fat surrounded
by myocardium, are known to be associated
with berry aneurysms and tuerescerous

Prior believes that the pathogenesis of
lipomatous hypertrophy of the interatrial sep-
tum is related to the hypertrophy of normal
fatty tissue present in the interatrial septum.\(^2\)
McAllister and Fenoglio suggest that it is
a hyperplasia of primordial fat.\(^1\) Neither
propose a neoplastic process as the essential
abnormality.

Our patient will have to be closely followed
up because the infiltrative process in
lipomatous hypertrophy of the interatrial sep-
tum seems to be progressive and symptoms of
obstructions may require excision of the
lesion.\(^3\)

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