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Interatrial Septum Hypertrophy: A Pitfall in Bicaval Cannulation

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Abstract

BACKGROUND: Lipomatous hypertrophy of the interatrial septum is a rare benign cardiac condition characterized by fatty tissue infiltration of the septum.

CASE PRESENTATION: We presented some interesting images and some possible pitfalls during the cannulation in this circumstance.

CONCLUSION: Surgical therapy appears to be reserved to patients with SVC obstruction or any rhythm disturbances.

Introduction

Lipomatous hypertrophy of the interatrial septum (LHIS) is defined as a non-capsulated, circumscribed fatty mass of the atrial septum [1], [2]. LHIS is uncommon, but due to technology is more frequently recognized. In several clinical studies, no typical symptoms of LHIS are described. This cardiac lesion can cause right atrial obstruction, superior vena cava syndrome (SVCS), intractable supraventricular arrhythmias, or sudden cardiac death [1], [2]. It was first described by prior in 1964 in five patients at postmortem examination [1], [2], [3]. Although many theories have been suggested, etiology of LHIS is still unknown [1], [2], [3], [4], [5].

Images Presentation

In this present report, we would like to present some interest images and some issues related to the extracorporeal circulation in this circumstance. Most LHIAS has the standard “dumbbell” appearance on echocardiography [5]. Cardiac magnetic resonance (CMR) confirms LHIAS by homogenous signal that was nulled on fat suppression images (Figure 1). In this figure, the excessive lipomatous hypertrophy is well seen produced reduction of the right atrium capacity. Computed tomography (CT) angiography of the chest shows a homogenous mass similar in radiodensity to extracardiac and pericardial fat. Unenhanced CT of the heart can be used to confirm LHIAS by the presence of low attenuation values for tissue (Figure 2) [5]. In Figure 2, the progressive obstruction of the SVC is seen due to LHIAS.

Discussion

In our knowledge, no one has described any pitfall or difficulty in cannulation during heart surgery in the presence of LHIS. We would like to present some interesting images and some issues related to LHIS. In case of LHIS, the cannulation of the superior vena cava may be difficult or impossible; so, we should pay attention. If the LHIS is severe and known preoperatively, the cannula should be inserted directly in the superior vena cava and not through the right

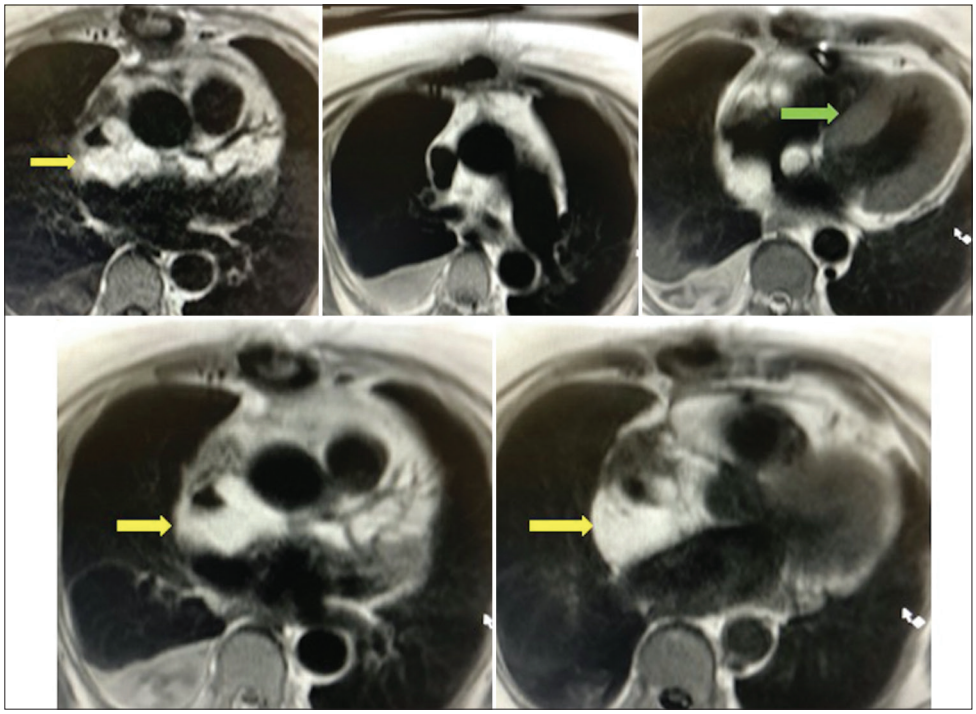


Figure 1: Cardiac magnetic resonance image showing the lipomatous hypertrophy of the interatrial septum with partial obstruction of the superior vena cava (yellow arrows) and the hypertrophy of the interventricular septum (green arrow)

atrium appendage. A special angulated cannula may be required. Alternatively, the cannula should be inserted in the jugular vein as it is used in minimally invasive cardiac surgery. Usually, there is not any problem with the cannulation of the inferior vena cava.

The SVCS caused by the LHIS may become more severe during surgery or in the early postoperative hours due to edema of the tissues. In this case, an alternative vein access should be ready for drug and fluid administration. We suggest the introduction of a venous 3 lumen line in the femoral vein for the patient safety. Often in heart valve disease, the interventricular septum is hypertrophied. Due to right atrial obstruction, the filling of this cavity may be difficult. For these two reasons, atrial pacing wires may be useful to enhance the atrial functionality. If the LHIS is symptomatic should be resected as single intervention [6] or during other surgical intervention in bicaval cannulation setting.

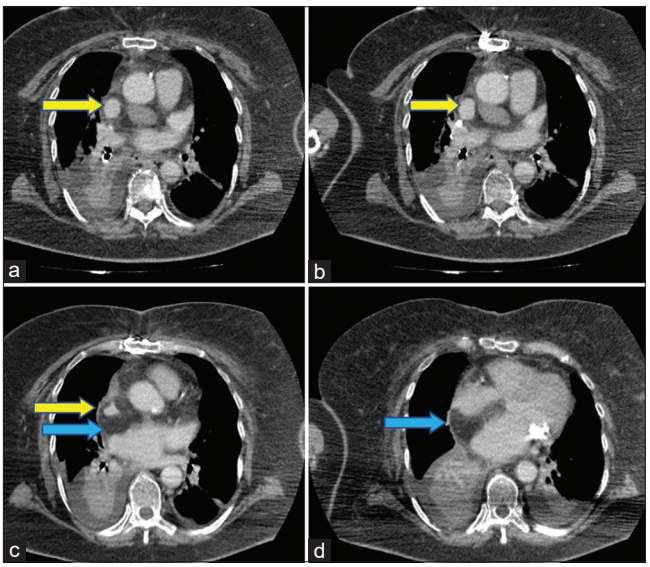


Figure 2: Progressive reduction of the superior vena cava (SVC) lumen due to restriction and compression caused by the LHIAS (plane a, b, c, yellow arrows). The excessive hypertrophy of the IAS (plane d, blue arrows) is strangulating the SVC (plane c, blue arrow) narrowing the right atrium capacity

Although LHIS has often been identified incidentally, atrial arrhythmias, including atrial fibrillation, atrial premature complexes, supraventricular tachycardia, ectopic atrial rhythm, junctional rhythm, or symptomatology of SVC obstruction have been associated with lipomatous hypertrophy [1], [2], [6]. Obstruction of the pulmonary vein also has not been described in the international bibliography. Intervention is not usually required. Surgical resection has been performed in symptomatic patients with SVC obstruction or with intractable arrhythmias [2], [3], [4],[6]. It differs from a pure lipoma in that lipomas are true neoplasms and usually occurs in a much younger patients. However, surgical treatment is similar for both [1], [4]. CT scan and CMR imaging can be useful in selected patients with large fatty infiltration or marked hypertrophy of the septum. Lipomatous hypertrophy of the IAS can be surgically excised [6]. The large IAS defect that results after excision of the mass requires closure using a pericardial or a synthetic patch. Recurrence after excision has not been reported, and the long-term prognosis is excellent [1], [2]. Malignant degeneration is a rare occurrence [1], [3], [4]. Surgical therapy appears to be reserved to patients with SVC obstruction or any rhythm disturbances [3], [6].

Conclusion

CT scan and cardiac magnetic resonance imaging can be useful in selected patients with large fatty infiltration or marked hypertrophy of the septum. Lipomatous hypertrophy of the IAS can be surgically excised. The large IAS defect that results after excision of the mass requires closure using a pericardial or a synthetic patch. Recurrence after excision has not been reported, and the long-term prognosis is excellent. Malignant degeneration is a rare occurrence. Surgical therapy appears to be reserved to patients with SVC obstruction or any rhythm disturbances.

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