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Case Report

Post Traumatic Tricuspid Regurgitation (PTR).

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Abstract

We present a successfully treated case of tricuspid regurgitation due to a rupture of a chordae following a chest trauma. A review of the literature demonstrates the rarity of this condition and the category of the surgical technic. Because we have used a bio prothesis for the tricuspid replacement.

KEY WORDS: tricuspid regurgitation, chest trauma, bio prosthesis.

Introduction

Post-traumatic tricuspid regurgitation (P.T.R) is an unusual complication of non- penetrating chest trauma. Todd and al. [1] described the first case of a P.T.R in 1848. Unfortunately, the frequency of P.T.R during the last 50 years has been increased. Over 100 cases have been recorded thus far in the literature [2]. Along with the development of fast transportation, the frequency of heart trauma, including the injury of the tricuspid valve, has been elevated. Traffic accidents are the major causes of traumatic tricuspid valve insufficiency, but other uncommon mishaps have also been incriminated. [3-5] The most part of patients got a closed chest trauma. Recently, P.T.R has been reported with the use of airbags system.[7]

The hemodynamic consequences are often well tolerated, and some cases may even be diagnosed several years after the incidental trauma. In our clinical case we describe a patient in whom tricuspid regurgitation developed after an old closed chest trauma.

Case Report

A 40 years man involved in a car accident in 2011, he sustained a chest trauma with a fracture of the right femur treated by osteosynthesis. During his hospitalization no major cardiac abnormalities were detected, after his discharge he remained asymptomatic for 12 years.in 2023 the patient developed a progressive worsening dyspnea, so he was referred to a cardiologist at the time a TTE performed with an ECG,the diagnosis of severe TR was retained and the patient referred to our heart surgical team.

The Physical examination at hospital admission revealed a systolic murmur 3/6 audible on the xyphoid

area without hepatomegaly. The electrocardiogram showed an atrial flutter. A chest radiograph disclosed a moderately enlarged cardiac silhouette. (fig1) the transthoracic echocardiography (TTE) revealed dilated right chambers, enlarged tricuspid annulus(58mm), and coaptation failure of the tricuspid valvular leaflets and flail of the tricuspid valvular leaflets leading severe tricuspid valvular regurgitation. The patient was not demonstrating right heart failure symptoms and signs. We eliminated the ebstein's malformation by a cardiac MRI.

During the intervention: the visual exploration showed a very dilated right chambers, and the tricuspid valve annulus was found to be dilated (enormous), with the rupture of chordae attached to the anterior leaflets; but the valvular tissues were soft without any calcification or vegetation (fig4).

The valve was replaced with 29 bio-prothesis (C-E PERIMOUNT magna mitral ease, model7300 TFX SERIAL 8817944) (fig2); we put a double chambre permanent epicardial stimulation probe as a prevention for conduction abnormalities; the postoperative course was uneventful. Postoperatively, the patient improved significantly. He was discharged on the postoperative 5th day on new oral anticoagulant (thrombix®) and diuretics. During the follow-up, we have noted the worn off the dyspnea with normal heartbeat.

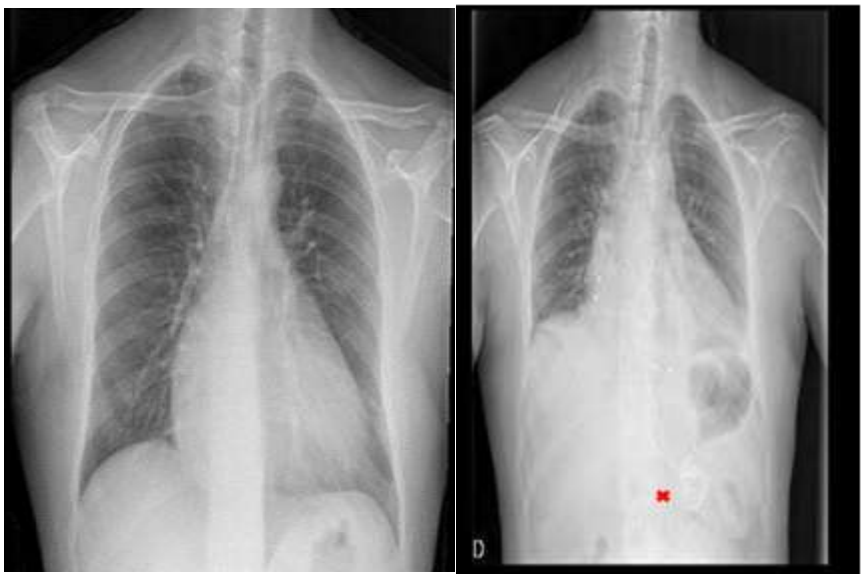

Figure 1: chest ray before surgery

chest ray: the third day after surgery with the permanent probe (x)

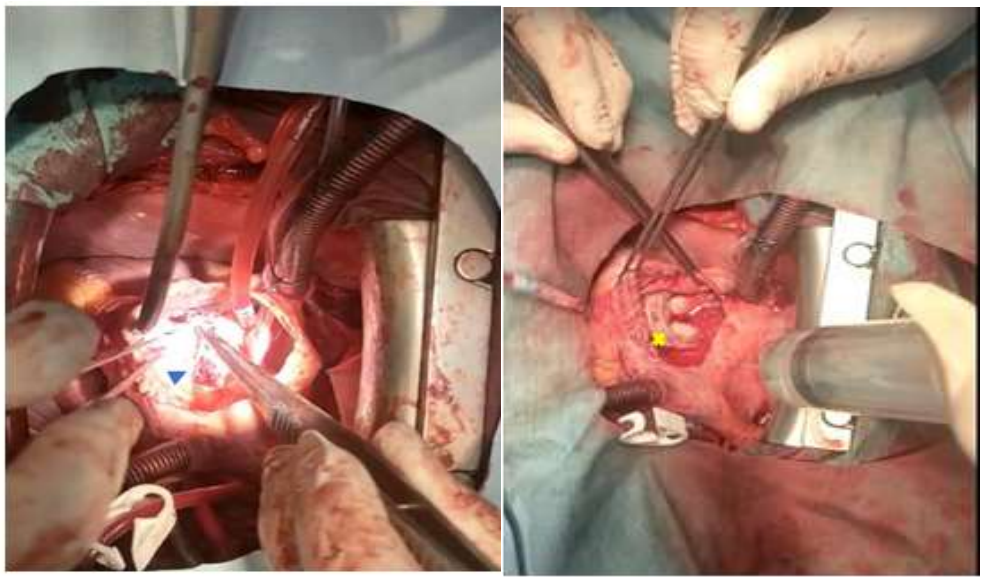

Figure 2: rupture of the chordae of the anterior valve

Bio prothesis (X)

Discussion

Tricuspid regurgitation is a rare complication of non-penetrating chest trauma. The true incidence of tricuspid valve injury is hard to estimate. Parmley et al. [8]

reported that they had determined eight cases of tricuspid valve injury in necropsy specimens of 546 cardiac injuries. The main mechanism of tricuspid lesion is the compression of the right atrium between sternum int front and the spine in the back, when the valves are closed with high pressure in the ventricles. The clinical presentation of post-traumatic tricuspid insufficiency usually depends on the

degree of insufficiency and the type of injury to the valve, and may vary from the rapid onset of heart failure to a slow but progressive course [9]. the rupture of papillary muscle generally leads to surgery in a shorter period than the rupture of chordae; the operation takes much longer time.

In our case a major discussion has been raised and the question was: how to repair this tricuspid lesion?

Alfieri and al. [10] described that the operative technique is designed primarily by the specific

anatomical lesions encountered at the time of surgery. Early operation facilitates repair of the valve. Repair of the tricuspid valve has been more frequent in recent years. In our case, the extensive annular dilatation and very extensive changes in the leaflets and chordae made repair more complicated, with an expectation of good long-term results beside that our team has not a good experience in the complex reparation of the native valves. The most frequently reported injury is chordal rupture (55% of the cases), followed by rupture of the anterior papillary muscle (27%) and tear of the leaflets (15%).[11] Some surgeons prefer reconstructive surgery (Devega plasty, annuloplasty, Implantation of artificial chordae, quadrangular resection of the flail segment). However, When the tricuspid lesion is not considered reparable, valve replacement becomes inevitable. In our patient, the tricuspid valve was replaced with bovine xenograft, which we generally prefer to mechanical valve in the tricuspid position because of the low incidence of complications and the good long-term durability associated with this bio prosthesis. In addition to, the use of anticoagulation therapy just for a short time of three months gives a low risk of thromboembolism or hemorrhage. finally, we used the bipolar permanent probe as a prevention for the conduction abnormalities.

Conclusion

Our experience confirms that the clinical course of patients with traumatic tricuspid regurgitation is influenced by the severity and type of valve lesion and that surgical treatment provides excellent long-term survival. We conclude that patients sustaining major chest trauma should be closely evaluated by echocardiographic and followed-up regularly to allow early detection of tricuspid dysfunction and timely surgery.

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