

Exceptional life threatening complication 19 years after Ravitch correction of pectus excavatum.

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Abstract

Ravitch technique of chest correction has been considered, although invasive, as safe and efficacious surgical method. We describe a case of 35-year-old woman with cardiac tamponade and in cardiogenic shock due to exceptional late complication after pectus excavatum reconstruction by means of classic Ravitch technique 19 years earlier. This very late adverse event was caused by broken metal sternal wire that injured the wall of the ascending aorta. Patient underwent salvage repair of this segment of aorta in cardiopulmonary bypass. Postoperative course and post-discharge 3-year follow-up have been uneventful.

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We describe a case of 35-year-old woman with cardiac tamponade and in cardiogenic shock due to exceptional late complication after pectus excavatum reconstruction by means of classic Ravitch technique 19 years earlier. This very late adverse event was caused by broken metal sternal wire that injured the wall of the

ascending aorta. Patient underwent salvage repair of this segment of aorta in cardiopulmonary bypass. Postoperative course and post-discharge 3-year follow-up have been uneventful.

Therefore, life-threatening cardiovascular complications may occur even many years after reconstructive surgery for chest deformity.

Key words: pectus excavatum, Ravitch correction, late complication, cardiac tamponade

1. INTRODUCTION

Pectus excavatum, although rather rare with estimated prevalence 0.1 to 0.8% of life births, is the most common congenital chest deformity [1]. It usually has minimal or no influence on the physiological performance of the chest organs but rarely may lead to musculoskeletal pain, respiratory disorders or even heart failure [2, 3]. Of note, not uncommonly, the most troublesome symptoms are related to psychological aspects of body image and the quality of life [4].

Simplifying, there are two available methods of surgical corrections, the open Ravitch (with many later modifications) and minimally invasive Nuss. Generally, both mentioned above surgical techniques are considered safe with good late outcomes, including significant improvement in life quality [5]. Regarding late complications, they are relatively rare. Up to now, only single life-threatening adverse events throughout long-term follow-up period have been reported, although usually after Nuss operation [6].

In this report an exceptional but serious late complication requiring salvage cardiac surgical intervention many years after Ravitch chest correction for pectus excavatum is described.

2. CASE

A 35-year-old female patient was admitted to the regional hospital because of loss of consciousness episodes preceded by transient retrosternal pain after exercise. The only important issue of her medical history was surgical correction of congenital chest defect (pectus excavatum) that had been carried out 19 years earlier. It consisted of surgical unveiling of parasternal cartilages, sections of the ribs and their partial removal (that are usually too long), sternotomy and its stabilization with steel wires. A computed tomographic angiography (CTA) done on emergent basis revealed that a tip of the broken wire loop faced backwards and touched aortic wall (see Figure). Moreover, excessive accumulation of pericardial effusion was noted. Due to rapid deterioration of her clinical status she was transferred immediately by means of aircraft transportation to the referential cardiac surgical department and then directly to the operating room.

The salvage surgery was done from median sternotomy. Pericardial sac was filled with blood and clots. Intraoperative findings confirmed preliminary diagnosis of CTA. The anterior wall of ascending aorta was injured by the sharp tip of broken metal sternal wire that was facing to the mediastinum. Patient was connected to extracorporeal circulation and after cardioplegic cardiac arrest a dacron patch was implanted to the front wall of the ascending aorta and remnants of the metal wires were removed from the sternum.

Following surgery her clinical status had been improving systematically and eventually before she was discharged on day 16th in a good clinical shape. Both in-hospital stay and post-discharge follow-up period (up to now more than 3 years) were uneventful.

DISCUSSION

Our case of the young lady showed that even many years after operations for pectus excavatum applying the Ravitch method, life-threatening complications may occur. Their prevalence is unknown. Even recent meta-analysis comparing two methods of chest reconstruction failed to assess long-term outcomes due to a scarce of reliable information [5]. Of note, analyzing our patient, we are not able to explain exact mechanism of this event. Abnormal stress put on the sternum during exercise leading to the wire rupture and its backward distortion might be one of them. Wire discontinuity was rather new because the tip was sharp and uncovered by connective tissue (intraoperative finding) that could have protect adjacent tissue, including the closest cardiovascular structures.

Although, recurrence rate after open thoracic wall reconstruction is low, the anterior-posterior chest dimension is usually small, particularly in women. Therefore, in our opinion, in these patients the risk of injury of any tissues and organs underneath the sternum is higher than after standard cardiac surgical procedures performed from median sternotomy. Consequently, we were taught that each symptoms related to pain and subsequent low cardiac output syndrome must not be ignored even many years after procedures on chest considered as relatively safe.

Our report confirmed again how important diagnostic tool is CTA. Currently it is considered as a method of choice in diagnostic process of the vast majority of cardiovascular pathologies due to its common availability and short examination time [7].

CONCLUSION

Life-threatening cardiovascular complications may occur even many years following reconstructive operations for chest deformity and in some of them emergent cardiac surgical intervention is the only lifesaving option.

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Figure caption

Broken sternal wire tip facing backwards into mediastinum

