Treatment of pectus excavatum recurring after open surgery using Nuss procedure: A case report

Açık cerrahi sonrası nükseden pektus ekskavatumin Nuss tekniği ile tedavisi: Bir olgu sunumu

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SUMMARY

We would like to report a 14-year-old male patient with pectus excavatum that recurred 10 years later after Ravitch surgery who was successfully operated using Nuss procedure. The patient underwent pectus excavatum surgery using Nuss procedure. The patient was discharged from the hospital at post-operative 5.day. The bar is planned to be removed in post-operative 3.year. In conclusion, surgery of pectus excavatum that recurred after open surgery is risky. Nuss procedure, which is a minimally-invasive technique, is a safe procedure that can be successfully applied in recurring cases due to short time of surgery and minimal blood loss.

Keywords: Recurrent Pectus Excavatum, Nuss procedure, Ravitch procedure

ÖZET


Anahtar sözcükler: Nüks pektus ekşkavat, Nuss yöntemi, Ravitch yöntemi
INTRODUCTION
Pectus excavatum (PE) is the most common chest deformity that occurs in 1/400 births and is characterized by posterior depression of sternum and lower costal cartilages. Standard open surgical procedure for PE was defined by Ravitch in 1949. Minimally invasive procedure that was introduced by Nuss has begun to be recognized around the world since 1997. Recurrence rates after Ravitch procedure were reported as 2-37%. In recurring patients, re-operative open surgery is concerned with serious blood loss due to large dissection, pericardial and pleural adhesions, long time of surgery and poor results. Nuss procedure is a good alternative method to repair recurring deformities.

We would like to present this case to report that our patient with pectus excavatum that recurred 10 years later after Ravitch surgery was successfully operated using Nuss procedure.

CASE REPORT
The patient was a 14-year-old male, who underwent Ravitch procedure due to pectus excavatum in another center 10 years before. The patient presented with a sunken chest, chest pain and psychological disorder. Physical examination found scar tissue caused by the previous surgery and pectus excavatum deformity (Figure 1).

Cardiac examination of the patient showed no pathology. Pre-operative evaluation found no pathology in blood laboratory tests, respiratory function test and echocardiography. Computed tomography that was taken before the surgery showed abnormal ossification in costal cartilages and depression of sternum (Figure 2).
Figure 2: Pre-operative computed tomography images

Haller index was 4.75. As the patient was a recurring patient, firstly thorax was entered with 5 mm trocar from the right. Imaging showed minimal adhesions at the posterior of sternum at pericardium. We decided to perform Nuss procedure when we saw a low amount of adhesion inside the thorax. The adhesions at the posterior of thorax were separated by blunt dissection using an introducer. After separation of adhesions, a pectus bar was inserted to the patient using Nuss procedure and the deformity was corrected (Figure 3, 4). The patient was administered controlled analgesia (PCA) for the first 48 hours and nonsteroidal anti-inflammatory and paracetamol the next days for postoperative pain. Post-operative patient developed no complications. The patient was discharged from the hospital on postoperative 5.day. The patient is currently in postoperative first year and no complication has developed. We plan to remove the bar in post-operative third years.

DISCUSSION
Various procedures varying from Ravitch procedure to Nuss procedure have been reported in pectus excavatum surgery since 1949. Recurrence after open surgery and minimally invasive surgery are different. Majority of recurrences in open surgery occur in 1-3 years. Predisposing factors in recurrence are surgery age, large resection of ribs and Marfan syndrome. On the other hand, in minimally invasive surgery, it results from early bar relocation or early bar removal due to local infections. Recurrence occurred 10 years after open surgery in our patient.
Guo et al., attributed re-operation indications to age, symptoms, outlook of chest wall and psychological disorders\(^7\). While mean re-operation age in their series was 14.6, our patient was 14 years old, which is a suitable age for Nuss procedure. Haller index of our patient was over 3.2. His symptoms included chest pain and psychological disorder due to recurrence. The patient had reoperation indication. Recurring pectus excavatum surgery is more difficult and dangerous than primary surgery due to adhesions between sternum and mediastal structures. A review of the
literature found modified Nuss procedures involving bilateral thoracoscopic incision beneath the xiphoid to dissect mediastinal adhesions. Since there wasn’t much thoracic adhesion in our patient, we employed Nuss procedure. We could have preferred modified Nuss procedure if there were more adhesions.

A review of the literature found complications such as pneumothorax requiring tube, hemothorax, pleural effusion, pericarditis, pneumonia, wound site infection, cardiac injury, death and slipped bar after minimally invasive surgery of recurring patients. Our patient developed no complications during our 1-year follow-up.

In conclusion, pectus excavatum surgery that recurred after open surgery is risky and requires fortitude. Minimally invasive Nuss procedure, which is a minimally-invasive technique, is a safe procedure that can be successfully applied in recurring cases due to short time of surgery and minimal blood loss.

REFERENCES