CMJ Case Report December 2016, Volume: 38, Number: 4

Cumhuriyet Medical Journal 350-354

http://dx.doi.org/10.7197/cmj.v38i4.5000158115

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

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

Yucel Akkas [1], Bulent Kocer[1], Neslihan Gülay Peri[1], Tevfik Kaplan[2]

[1]Department of Thoracic Surgery, Ankara Numune Research and Training Hospital , Ankara, Turkey
[2]Department of Thoracic Surgery, Ufuk University Faculty of Medicine, Ankara, Turkey
Corresponding author: Yucel Akkas, Department of Thoracic Surgery, Ankara Numune Research and Training Hospital , Ankara, Turkey
E-mail: y.akkas@yahoo.com
Received/Accepted: December 12, 2015 / October 31, 2016
Conflict of interest: There is not a conflict of interest.

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: Recurren Pectus Excavatum, Nuss procedure, Ravitch procedure

ÖZET

Ravitch cerrahisi sonrası 10 yıl sonra nüks eden pectus ekskavatumlu 14 yaşında erkek olguyu Nuss tekniği ile başarılı bir şekilde opere ettiğimizi bildirmek istedik. Hastaya Nuss tekniği ile pektus ekskavatum operasyonu yapıldı. Postoperatif 5. gün hasta taburcu edildi. Postoperatif 3. yılında barı çıkarılması planlanmaktadır. Sonuç olarak açık cerrahi sonrası nükseden pektus ekskavatum cerrahisi riskli bir operasyondur. Minimal invaziv teknik olan Nuss operasyonu rekürren vakalarda kısa operasyon süresi ve minimal kan kaybı ile beraber başarılı bir şekilde uygulanan güvenli bir tekniktir.

Anahtar sözcükler: Nüks pektus ekskavatum, 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 [1]. Standard open surgical procedure for PE was defined by Ravitch in 1949[2]. Minimally invasive procedure that was introduced by Nuss has begun to be recognized around the world since 1997[3]. Recurrence rates after Ravitch procedure were reported as 2-37% [4]. 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[5]. 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).

Figure 1: Image of deformity of recurring pectus excavatum after open surgery

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[2,3].

Causes of 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[4,6]. Recurrence occurred 10 years after open surgery in our patient.

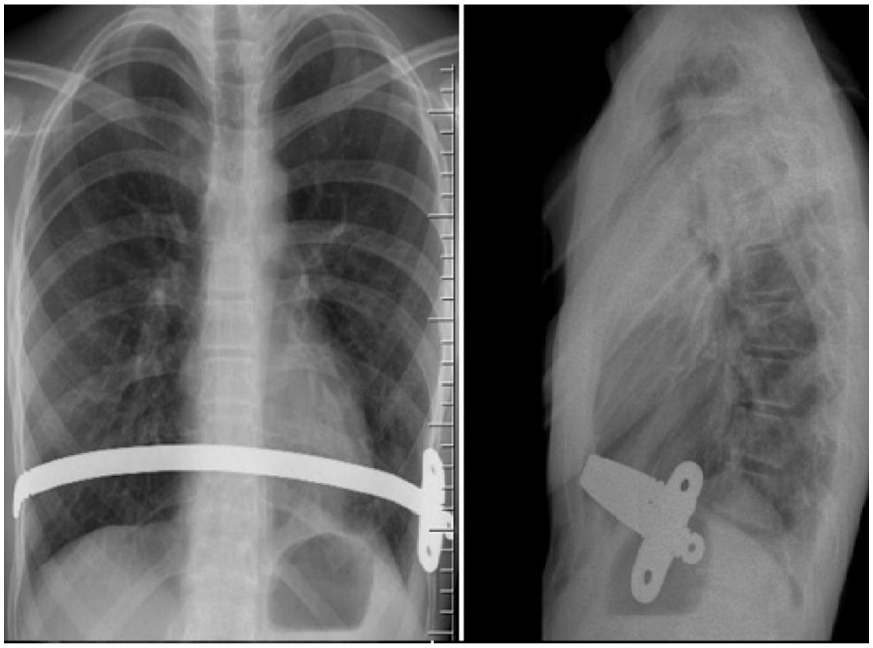

Figure 3: Posteroanterior and lateral lung graph images after Nuss procedure

Figure 4: Post-operative image of the patient

Guo et al., attributed re-operation indications to age, symptoms, outlook of chest wall and psychological disorders[7]. While mean reoperation 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[7,8]. 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 [7,8]. 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

1. Jaroszewski DE, Fonkalsrud EW. Repair of pectus chest deformities in 320 adult patients: 21 year experience. Ann. Thorac Surg 2007; 84: 429-33.
2. Ravitch MM. The operative treatment of pectus excavatum. Ann Surg 1949; 129: 429-44.
3. Nuss D, Kelly RE, Croitoru DP, Katz ME. A 10-year review of a minimally invasive technique for the correction of pectus excavatum. J Pediatr Surg 1998; 33: 545-52.
4. Ellis DG, Snyder CL, Mann CM. The 're-do' chest wall deformity correction. J Pediatr Surg 1997; 32: 1267-71.
5. Miller KA, Ostlie DJ, Wade K, Chaignaud B, Gittes GK, Andrews WM et al. Minimally invasivebar repair for 'redo' correction of pectus excavatum. J Pediatr Surg 2002; 37: 1090-2.
6. Haller JA jr, Colombani PM, Humphries CT, Azizkhan RG, Loughlin GM. Chest wall constriction after too expensive and too early operations for pectus excavatum. Ann Thorac Surg 1996; 61: 1618-24.
7. Guo L, Mei J, Ding F, Zhang F, Li G, Xie X et al. Modified Nuss procedure in the treatment of recurrent pectus excavatum after open repair. Interactive Cardiovasc and Thorac Surg 2013; 17: 258-62. doi: 10.1093/icvts/ivt150.
8. Yuksel M, Bostanci K and Evman S. Minimally invasive repair after inefficient open surgery for pectus excavatum. Eur J of Cardiothorac Surg 2011; 40: 625-29. doi: 10.1016/j.ejcts.2010.12.048.