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451. Special problems in thoracic surgery

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Is small-bore catheter efficient in different type of pleural pathologies?

Serife Liman¹, Aykut Eliçora¹, Asli Akgül¹, Salih Topcu¹, Seymur Mehmetoglu¹, Serkan Ozbay¹, Fatih Sezer¹, Can Koska², Ahmet Ilgazlı³. ¹Thoracic Surgery Department, Kocaeli University, Faculty of Medicine, Kocaeli, Turkey; ²Intern Doctor, Kocaeli University, Faculty of Medicine, Kocaeli, Turkey; ³Chest Diseases Department, Kocaeli University, Faculty of Medicine, Kocaeli, Turkey

In recent years, there is a tendency to use small-bore catheters for pleural pathologies. We aimed to share our experiences about small-bore catheter usage in different pleural diseases.

Between 2006 and 2011, 287 patients with pleural pathologies were treated via 309 small-bore (10F) thoracic catheters. There were 204 male and 83 female patients (mean age: 52). There were 265 unilateral single catheter insertions, 15 bilateral insertions and 7 two-catheters insertions in same hemithorax consecutively. The most frequent indication was pleural effusion (147 catheters), 103 of them were due to malignant pleural diseases. Small-bore catheters were performed in 133 cases with pneumothorax, 21 cases with hemothorax and 8 cases with hemopneumothorax. Pleurodesis were performed effectively with povidone iodine in one, talc in 35 cases.

In 7 patients (3 malignant pleural effusion, 1 empyema, 2 spontaneous pneumothorax and 1 traumatic pneumothorax) second catheter insertion in different localization was needed. In 15 patients (7 spontaneous pneumothorax and 5 malignant pleural effusion, 1 barotrauma pneumothorax, 1 pneumothorax as complication, 1 empyema) pleurocatheters were ineffective and they changed with small-bore trocar catheters. Our results showed 7.2% failure ratio.

Six patients underwent operation because of persisted air leakage.

Mean duration time of the catheters were 5.6 days (1-20 days). They showed difference depending upon the pleural pathologies. For pleurodesis, mean duration time of pleurocatheters was 4.7 days.

We found small bore catheters very effective in not only malignant pleural effusion and pneumothorax but also in hemothorax and parapneumonic effusions.

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Thoracoplasty in the treatment of chronic nonspecific empyema

Serhiy Koshak¹, Oleksander Beliak¹, Orest Petryshyn¹, Mykhaylo Sekela².

¹Thoracic Department, Lviv Regional Center of Phthisiology & Pulmonology, Lviv, Ukraine; ²Thoracic Department, Lviv Regional Center of Phthisiology & Pulmonology, Lviv, Ukraine

Background/Objectives: Problems in the treatment of chronic nonspecific empyema of pleura (CNEP) remain relevant.

Material and methods: 207 patients were treated with CNEP in clinics of Lviv Regional Center of Phthisiology and Pulmonology and Lviv Regional Hospital at the past 30 years, aged 15 - 80 years from 1.5 month to 13 years from the date of diagnosed acute suppuration pleura.

Results: Reasons CNEP: purulent inflammation of the lungs with bronchopleural fistula and residual pleural cavity were found in 125 (60.38%) patients; suppuration of hemothorax - in 28 (13.53%), suppuration of pleural effusion - in 22 (10.64%); complications after surgery - in 24 (11.59%), pleural cavity foreign body - in 8 (3.86%). An operations: dekortykation with resection and lung and pleura were performed in 95 cases, including lob -, bilobektomy - in 23; atypical segmentektomy - in 16; pleuropulmonektomy - in 7, taking in bronchial fistulas - in 17. If you have problems with smoothing out the lung, intrapleural thoracoplasty operation completed (47 cases). In 4 patients with significantly reduced spirometry and hasmetry was performed ekstrapleural thoracoplasty. In the postoperative period died 6 (2.89%) patients. After thoracoplasty all patients survived.

Conclusion: We believe that the most appropriate and economically justified in patients with radical resection is CNEP lungs and pleura. Nonaccordance volume of lung and pleural cavity requires plastic chest wall.

P4419

Interleukin 27 (IL27): A new tool for lung cancer gene immunotherapy?

Tomasz Wandtke¹, Marek Jankowski¹, Piotr Kopinski¹, Mariusz Bella², Janusz Kowalewski², Adam Szpechcinski³, Ewelina Pólgesek¹. ¹Dept. of Gene Therapy, Collegium Medicum, Nicolaus Copernicus University, Bydgoszcz, Poland; ²Dept. of Chest and Tumor Surgery, Collegium Medicum, Nicolaus Copernicus University, Bydgoszcz, Poland; ³Laboratory of Molecular Diagnostics and Immunology, Institute of Tuberculosis and Lung Diseases, Warszawa, Poland

Introduction: Recent studies reported strong anti-tumor activity of APC-derived

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IL27, cytokine driving Th1 immunity and stimulates cytotoxic response. However, IL27 has not been considered yet as a tool in lung cancer gene immunotherapy.

Aims: Construction of a plasmid encoding IL27. Evaluation of its transfection efficacy in non-small (A549) and small (NCI-H82) cell lung cancer model lines.

Methods: IL27 cDNA was cloned into pSMx-IG plasmid. Lung cancer cells (A549 and NCI-H82) were transfected either with IL27 construct (pXMs-IL27) or empty plasmid as a control. Transfection efficacy was proved by RT-PCR and anti-IL27 immunostaining. Cell cycle and apoptosis (TUNEL assay) was assessed by flow cytometry.

Results: pXMs-IL27-transfected cancer cells expressed IL27, as it was revealed by positive RT-PCR and flow cytometry (A549: 79%; NCI-H82: 56%, median of 5 experiments). Unexpectedly baseline IL27 expression was also found in non-transfected cells, particularly in A549 line (40%). Tumor cells transfected with pXMs-IL27 plasmid showed intense apoptosis, as compared with empty plasmid control.

Conclusions: We proposed the model of future lung cancer gene immunotherapy with use of IL27 encoding plasmid. However, low IL27 expression in non-transfected lung cancer cells calls in question its antitumor activity as a local immune stimulator. On the other hand, increased apoptosis of transfected cancer cells was observed, suggesting direct impact of IL27 on tumor cells.

P4420

Perioperative considerations for patients with asthma underwent thoracic surgery

Yordanka Yamakova, Rosen Petkov, Georgi Yankov, Danaïl Petrov. Anesthesiology and Intensive Care, University Hospital of Pulmonary diseases "St. Sophia", Sofia, Bulgaria Thoracic Surgery, University Hospital of Pulmonary diseases "St. Sophia", Sofia, Bulgaria Thoracic Surgery, University Hospital of Pulmonary diseases "St. Sophia", Sofia, Bulgaria Thoracic Surgery, University Hospital of Pulmonary diseases "St. Sophia", Sofia, Bulgaria

Asthmatic patients are a challenging population for anesthesiologists.

Aim: The aim of this study was to determine the perioperative complications in asthmatic patients with symptoms before the surgery.

Material and methods: From 2007 to 2011 44 patients with asthma underwent thoracotomy. We classified the patients into two groups: First group (n 19) - patients with asthma who currently have no symptoms and second group (n 25) - asthmatic patients with symptoms before surgery. Pulmonary function was optimized preoperatively in all patients and airway obstruction was controlled by using steroids and bronchodilators. We conducted deep anesthesia with Sevoflurane, Fentanyl and Pipecuronium. We monitored several parameters: tidal volume, inspiratory, expiratory volume, Ppeak, Pplat, ETCO₂, PaCO₂.

Results: The First group patients had less incidences of perioperative bronchospasm than those in the second ($p < 0.025$). We detected some statistical differences in the parameters: the gradient between ETCO₂, PaCO₂ is bigger in second group ($p < 0.025$) and we detected an increasing Ppeak and Pplat in asthmatic patients with symptoms before surgery.

Conclusion: Symptomatic asthmatic patients had more the incidence rate of the perioperative complications. With deepening anesthesia level and aggressive pharmacological management the anesthesiologist minimize the risk of complications.

P4421

Application of one-lung high frequency jet ventilation (OHFJV) in lung surgery

Mikhail Kontorovich, Sergey Skornyakov, Igor Medvinsky, Igor Motus, Dmitry Ereemeev. Department of Surgery, Urals Research Institute for Phthisiopulmonology, Ekaterinburg, Russian Federation

Objectives: In any cases lung surgery including thorascopic procedures requires ventilation of one lung. The aim of the study was to examine physiologic features of OHFJV in lung surgery.

Materials and methods: We compared two groups of patients comparable in terms of surgery, comorbidity, age of patients underwent lung resections. In the group I (n=101) we conducted traditional one-lung controlled mechanical ventilation (OCMV). The regimen was CMV ($f = 17-19$ cycles in minute, $V_T = 260-410$ ml, $I:E = 1:2$). In the group II (n=112) OHFJV was conducted ($f = 100$ cycles in minute, $V_T = 150-170$ ml, $I:E = 1:2$). In both groups $F_iO_2 = 0,21$.

Results: OHFJV provided more effective intrapulmonary kinetics and respiratory gases distribution. OHFJV being compared with OCMV showed some advantages which are as follows: I. Increasing of the volume of alveolar ventilation (V_A), reducing of the volume of physiological dead space (V_{AD}) in 2,5 times, reducing proportion (V_{AD}/V_A) in 5 times, reduction physiological blood shunt by 80%, and increasing PaO₂ by 16,7% indices PaCO₂ and pH being normal. II. There were significantly lower indices of transpulmonale pressure, contributing to an increased venous return to heart and cardiac output.

Conclusion: Thus, OHFJV provides adequate gas exchange, and creates favorable conditions for the surgeon.

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Minimally invasive repair of pectus carinatum: A single institution experience

Korkut Bostanci, Hakan Ozalper, Barkin Eldem, Adamu Issaka, Onur Ermerak, Zeynep Bilgi, Volkan Kara, Mustafa Yuksel. Department of Thoracic Surgery, Marmara University Faculty of Medicine, Istanbul, Turkey

Minimally invasive repair of pectus carinatum (MIRPC) has become an alternative technique to open surgery in recent years due to the successful surgical outcomes of the centers performing it. The aim of this study was to investigate the results of MIRPC at our institute.

Fifty-eight cases who had had MIRPC between January 2006 and February 2012 were included in the study and were evaluated retrospectively according to the demographics, form of the deformity, number of presternal bars, operation duration, perioperative and postoperative complications, length of hospital stay, reoperations, bar removal and patient satisfaction.

Fifty-four of the patients were male and the median age was 16.5 (range:10-27) in the series. The deformity was symmetric in 40 and asymmetric in 18 cases. Following the first 3 cases being operated on placing regular excavatum bars presternally, we developed our own carinatum bar and stabilizing system and modified it in years, using them in the rest of the patients. One bar and two stabilizers were used in all patients for the correction of the deformity. The median operation duration was 60 minutes (range: 45-110) and the median duration of hospital stay was 5 days (range: 2-18). Excellent esthetic results obtained regarding the postoperative course, verified with the satisfaction questionnaires; all patients except one feeling satisfied with surgical outcome. The bars have been removed in 10 patients on planned time without any recurrence.

Minimally invasive repair of pectus carinatum can be preferred for the short operating time, low morbidity and high levels of patient satisfaction.

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Large chest wall resection and reconstruction using titanium meshplate and pedicled muscular flap: Report of 6 cases

Altug Kosar¹, Hatice Eryigit¹, Levent Alpaz², Ersin Cardak¹, Kadir Ozer¹, Recep Demirhan¹. ¹Thoracic Surgery, Dr. Lutfi Kirdar Kartal Training and Research Hospital, Istanbul, Turkey; ²Thoracic Surgery, Sureyyapasa Chest Disease and Chest Surgery Education and Research Hospital, Istanbul, Turkey

The aim of this clinical study was to evaluate effectiveness of titanium meshplate for chest wall reconstruction after chest wall tumor resection.

Between 2009 and 2012, 6 patients with chest wall tumors were treated surgically. There were 3 female and 3 male patients and their ages ranged from 26 to 76 years. The patients were admitted due to chest pain and swelling. Tumors were placed on sternum in 3 of the patients and on anterolateral chest wall in 3 of them. After tumor resection, defect size ranged from 10 cm. x 14 cm. to 12 cm. x 20 cm. Chest wall reconstructions were performed using titanium meshplate and pedicled muscular flaps. Titanium meshplates were fixed in ribs and/or sternum by titanium wires or screws.



Postoperative pathology for sternal tumors were condrosarcoma, malign melanoma and liposarcoma, and for chest wall tumors they were osteochondroma, malign fibrous histiocytoma and lymphoma. There were no paradoxical movement, difficulty in breathing, or prosthesis-related complications during the follow-up period. Only in one patient muscular flap necrosis has occurred. Therefore second operation was performed for removal of necrotic muscular flap. The mean postoperative follow-up period was 15 months (range, 2-36 months).

We consider that, titanium meshplate is an easily applicable and suitable material to use in the reconstruction of large chest wall defect.

P4424

Thoracic paravertebral block for awake videothorascopic surgical procedures of high risk patients

SVilen Alexov¹, Danaïl Petrov². ¹Anesthesiology and Intensive Care Clinic, University Hospital of Pulmonary Diseases "St. Sophia", Sofia, Bulgaria; ²Thoracic Surgery Clinic, University Hospital of Pulmonary Diseases "St. Sophia", Sofia, Bulgaria

Objective: To present our experience and evaluate feasibility of thoracic paravertebral block as adequate anesthesia for some awake video-assisted thorascopic surgical procedures in high risk patients.

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Methods: Seven (ASA IV) patients had multiple unilateral thoracic paravertebral blocks from Th3 to Th9 levels with 0.5% levobupivacaine as only anesthesia for their VATS procedures. Patients were awake, lightly sedated and spontaneously breathing 100% oxygen via tight mask during the whole procedures. Paravertebral catheters were inserted at Th5-6 interspace for postoperative analgesia. The performed surgical procedures were: inspection, debridement, evacuation of haematoma, pleural or lung biopsies, pericardial fenestration, partial pleurectomy, talc pleurodesis, packing with wet dressing of povidone-iodine, or combinations of all mentioned above.

Results: Thoracic paravertebral anesthesia provided very good conditions for VATS and postoperative pain relief for presented patients. The mean duration of the procedures was 64 minutes. The procedures were well tolerated, respiratory status was stable, and oxygen saturation was maintained above 95%. Pain and panic attacks were well controlled. Spontaneous breathing and hemodynamics were well maintained during the operations. Recoveries were uncomplicated despite the underlying gross pathology.

Conclusions: Thoracic paravertebral blockage appears to be promising and feasible anesthetic management of some awake VATS procedures, especially when hemodynamic stability, adequate venous return and preservation of spontaneous ventilation are very important anesthetic goals.

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Video-assisted thoracoscopic surgery of mediastinal cysts: Report of 13 cases
Yener Aydin¹, Omer Araz², Mesut Ozgokce³, Ilker Ince⁴, Fatih Alper³, Atilla Eroglu¹. ¹Department of Thoracic Surgery, Ataturk University, Erzurum, Turkey; ²Department of Chest Diseases, Ataturk University, Erzurum, Turkey; ³Department of Radiology, Ataturk University, Erzurum, Turkey; ⁴Department of Anesthesia and Reanimation, Ataturk University, Erzurum, Turkey

Background: Mediastinal cysts are rare anomalies. The purpose of this study was to present our experience with mediastinal cysts who were thoracoscopic treated in our clinic and to discuss our findings along with those from the literature.

Methods: We retrospectively investigated 13 patients who were diagnosed and thoracoscopic treated for mediastinal cysts in our clinic between January 2008 and December 2011.

Results: Seven patients were female and six patients were male. The average age of the patients was 41.3±20.3 (7-82 years old). The mediastinal cysts comprised five pericardial cysts; four bronchogenic cysts; one hydatid cyst; one benign cystic teratoma; one thymic cyst; and one neuroenteric cyst. In a case with ruptured hydatid cyst, we passed to thoracotomy intra-operatively due to presence of advanced adhesion related to inflammation. Postoperative complication and mortality did not occur in any case. The average postoperative hospitalization period was 3.8 days (2-7 days).

Conclusion: Video-assisted thoracoscopic surgery in mediastinal cysts is a reliable and effective approach with low morbidity and a shorter hospital stay.

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Impact of pulmonary metastasectomy on lung function parameters
Thomas Schweiger^{1,2}, Christoph Nikolowsky^{1,2}, Lukas Lehmann¹, Robert Wiebringhaus¹, Gyoergy Lang¹, Hendrik-Jan Ankersmit^{1,2}, Walter Klepetko¹, Konrad Hoetzenecker^{1,2}. ¹Department of Surgery - Division of Thoracic Surgery, Medical University of Vienna, Austria; ²Christian Doppler Laboratory for Cardiac and Thoracic Diagnosis and Regeneration, Medical University of Vienna, Austria

The lung is a common site of secondary growth in malignant diseases. Surgical resection of pulmonary metastases has been shown to prolong survival in patients with various primary tumor types. Today, even repeated resections of recurrent pulmonary metastases are common practice in thoracic surgery. The impact of metastasectomy on respiratory function has become a relevant factor in the treatment algorithm of these patients.

Since 2009, all metastasectomy patients at the Dept. of Thoracic Surgery, MUV, have been actively followed-up every three to six months after surgery. For 45 patients pre- and post-operative lung function data was obtained during the follow-up. In 19 patients metastases were removed by enucleation (laser=10; cautery=9), in 19 patients by wedge resection and 7 patients received lobectomy. Complete resection was obtained in all patients.

We found no difference in loss of FEV1 per resected nodule between laser and cautery enucleation. However, a significant difference in FEV1 and VC was found when comparing enucleation/wedge/lobectomy patients (FEV1 3.1±0.5, 7.6±1.5, 13.4±2.9; VC: 1.5±1.7, 4.7±1.7, 16.3±3.3). These findings were confirmed by evaluating the volume of the resected tissue and did not correlate with size of metastases as determined by pre-operative CT evaluations.

The surgical resection of pulmonary metastases is associated with a detectable but mild loss of lung function. Concerning the respiratory impairment, repeated resections of lung metastases should not be withheld from patients.

P4427

EBUS-TBNA as alternative of VATS-procedure for differential diagnosis of mediastinal lymphadenopathy

Igor Vasiljev², Nikolay Yakushenko¹, Dmitriy Sudomoin¹, Peter Yablonsky². ¹Endoscopy, FGBU "SPbNIIF", Saint-Petersburg, Russian Federation; ²Thoracic Surgery, FGBU "SPbNIIF", Saint-Petersburg, Russian Federation

Introduction: EBUS-TBNA - a relatively new technology, but very useful option in modern interventional pulmonology. Most of the articles devoted to staging of lung cancer. Not so much papers about differential diagnosis of tuberculosis and sarcoidosis 1.

Aim: To study of possibilities of EBUS-TBNA in differential diagnosis of tuberculosis and sarcoidosis 1.

Materials and methods: From March till December, 2011 30 ultrasonic video bronchoscopies for the purpose of performance of a transbronchial biopsy of lymph nodes of a mediastinum at 30 patients with a mediastinal lymphadenopathy have been executed. Middle age has made 30±8 years, 14 men and 16 women. The syndrome of a mediastinal lymphadenopathy was established on the basis of the data of a spiral computer tomography. The average size of LN - 1.6±0.4 cm, radiological signs of a pathology of lungs were absent. At all patients preliminary clinical inspection hasn't allowed to differentiate character of a lymphadenopathy. Second step in all were VTS biopsy of lung and histological examination (as gold standard).

Results: We didn't have any complications. After cytological examination we find cells of LN in 30 cases. We compared results of cytological and histological examinations. And the results were equal. We found 5 cases of tuberculosis, in 25 patients sarcoidosis. Diagnosis was confirmed by 6 month' period of follow-up.

Conclusion: We can see equal results of both examinations. May be in such cases we need not to do of VTS biopsy of lung and histological examination. (Time to change Gold standard?)

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Less pain without pain-killers?

Vasile Grigorie¹, Cornel Savu¹, Radu Posea¹, Boris Coman¹, Cornel Petreanu¹, Dan Avramescu², Nicolae Galie¹. ¹Thoracic Surgery, National Institute of Pneumology "Marius Nasta", Bucharest, Romania

Objectives: To assess if the mode of closing the thoracotomy may have an influence over the post-operative pain.

MATERIAL AND METHODS

Prospective study, with 2 groups of patients, 15 cases each. Group A – for this patients, the stiches used to close the thoracotomy were passed between the rib and intercostal nerve (in this cases the nerve wasn't compressed against the rib when the stich was tightened). Group B – the stiches were passed in classic fashion, inferior to intercostal nerve and when the thoracotomy was closed, the pressure of the stiches compressed the nerve against the rib. All patients had lateral thoracotomy, 3 stiches were used for all patients, no peridural/paravertebral catheter was used and regular analgesia (consisted in Paracetamol, Tramadol and NSAID) was used for all patients. For assessing the pain, we used a scale from 0-10, 0 = no pain, 10 = pain intensity was the biggest ever felt by the patient. We assess the pain in the first 48 h post-op and after 21 days.

Results: Group A – only 2 patients alleged pain score 10 in first 48 hours post op, 1 patient – score 9, the rest of the group pain was 8 or less. Group B – 13 patients alleged pain score 10 post-op, 1 patient – score 8 and 1- score 7. Pain assessed 3 weeks after: group A pain score range from 0 to 7, and in group B from 0 to 10.

Discussions: Pain is difficult to assess precisely because the threshold and perception is different from person to person. According with this study, it seems that involvement of the intercostal nerve in the closure of thoracotomy increase the post-operative pain, especially in the first 48 hours.

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WITHDRAWN

P4430**The feasibility of medical thoracoscopy in the treatment of multi-loculated pleural effusion**

Dohyung Kim¹, Bongsoo Son¹, Kildong Kim², Jungjoo Hwang². ¹*Thoracic and Cardiovascular Surgery, Pusan National University, Yangsan Hospital, Yangsan, Korea;* ²*Thoracic and Cardiovascular Surgery, Eulji University Hospital, Daejeon, Korea*

Introduction: Optimal surgical procedure must be selected according to empyema stage in the treatment of multi-loculated empyema. However, it is difficult to select the optimal procedure using conventional staging system. The medical thoracoscopy is an ideal diagnostic tool of pleural disease, we used medical thoracoscopy to evaluate the accurate staging of empyema and to select optimal surgical procedure.

Methods: 108 patients were transferred to treat multi loculated pleural effusion. The type of surgical procedure was selected according to the empyema stage of American Thoracic Society. Group I (n=44) was staged according to conventional staging system such as onset time, pleural fluid finding and CT findings, and group II(n=64) according to the finding of medical thoracoscopy.

Results: There was no significant difference of morbidity and mortality between two groups ($p < 0.05$). The 20 closed thoracostomy(45.5%), 6 VATS decortication(13.6%), and 18 open decortication (40.9%) were performed in group I. 16 cases of 18 open decortication were undertaken due to the failure of first treatment (12 closed thoracostomy, 4 vats decortication). In group II, 43 loculation broken up and closed thoracostomy during medical thoracoscopy (67.2%), 15 VATS decortication (23.4%), and 6 open decortication (9.4%). There was no failure primary procedure. The procedure of group II is significantly lesser invasive and the thoracotomy rate is also lower than group I($p < 0.05$)

Conclusions: The medical thoracoscopy is helpful to decide the optimal procedure in the treatment of multiple loculated empyema. We could decrease the incidence of open thoracotomy to use medical thoracoscopy.

P4431**May the Nuss operation be minimally invasive procedure in adults**

Rauf Gorur, Fatih Candas, Akin Yildizhan, Nurettin Yiyit, Turgut Isitmangil. *Thoracic Surgery, GATA HEH, Uskudar, Istanbul, Turkey*

The repair of pectus excavatum with Nuss procedure (group N) is well established among pediatric surgeons. It named minimally invasive surgery. Studies on adult patients are rare. We compared Nuss procedures and Ravitch procedures (group R) on adult patients, which of them minimally invasive in respect to skin incisions. We retrospectively analysed 35 adult patients (16 Nuss procedures, 19 Ravitch procedures) from 2007 to 2011. In two groups all patients aged older than 20. Ravitch procedures performed midsternal vertical incision and substernal metal bar. For Nuss procedures three skin incisions was performed, a 10-mm blunt-tip trocar was introduced into the chest. A subcutaneous tunnel was created by blunt dissection to the highest point of the funnel. A long steel introducer was inserted into the chest and pushed behind the sternum anterior to the pericardium. Finally, the bar was rotated 180°, and the sternum was tilted upward. A stabilizer was placed on the left side of the bar.

In group R 12.5 cm (10-17 cm) skin incision was performed. Non-steroidal anti-inflammatory analgesic used for post-operative pain. We did not observe any relaps and major complication. In group N 8.5 cm (7-12.5cm) skin incision was performed. Opioid derived was used for post-operative pain. We observed early bar dislocation at four patients, two haemothoraces, three pneumothoraces and one severe post-operative pain.

In Nuss procedures should not require chest wall resection and it may do small skin incisions. But Nuss procedure have lots of complications. In Ravitch procedure, much more effective and less invasive and have little complication. We have lots of question marks.