

Single port videothoroscopic approach: initial experience

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During the last years minimally invasive techniques have gained more consensus in thoracic surgery. Single port videothoroscopic approach allows to perform all surgical procedures carried out with conventional triportal approach. We present our initial experience with this technique.

In the last 2 years we have performed 87 surgical procedures with single port approach. The skin incision was performed almost always at 5th intercostals space and ranged from 2 to 5 cm depending on the planned procedure. Minor procedures were: 52 cases of underwent pleural biopsies and chemical pleurodesis for neoplastic pleural effusion, 7 mediastinal biopsies for anterior mediastinal mass and 6 apicectomy and pleurectomy for pneumothorax. Major procedures were: 9 lobectomies for lung cancer (4 right upper lobectomies, 3 left upper lobectomies and 2 left lower lobectomies), 8 wedge resections for pulmonary metastases and 5 resections of posterior mediastinal masses.

No major postoperative complications were observed. The mean length of hospitalization for no lobectomy patients was 2.1 ± 1.1 days. The mean age of lobectomy patients was 64.2 ± 13 years. The mean operative time was 165.7 ± 39 minutes (range 110-220 minutes). In all patients a complete lymph node dissection was performed. The chest tube was removed after 2.3 ± 1.7 days and the mean length of stay was 3.4 ± 1.8 days. In other two patients the planned single port lobectomy was converted to lateral thoracotomy because of bleeding. The visual analogic scale (VAS) was used to assess the postoperative pain and the highest score was 3.

Single port videothoroscopic approach represents a new challenge for diagnostic and therapeutic procedures. Major pulmonary resections are feasible and safe with a reduction on postoperative pain and earlier discharge.

Comparison of two surgical approaches for the treatment of primary spontaneous pneumothorax

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Aim. The authors report a retrospective study on surgical treatment of primary spontaneous pneumothorax (PSP). Surgical approaches by Videoassisted axillary mini-thoracotomy (VAMT) and three-port VATS (t-VATS) are compared. Mean post-operative stay (MPS) and ipsilateral recurrence rate (IRR) are assessed. Secondary endpoints were about complications, early post-operative pain and long term neurologic symptoms.

Method. From January 2009 to December 2011 we consecutively observed 85 cases of PSP. Treatment was represented by surgery in 52 patients: the approach was by VAMT in 39 instances and t-VATS in 13. Median follow-up was 30 months.

Results. Patients submitted to surgery had a MPS of 6.62 ± 1.5 days for VAMT and 6.69 ± 3.4 days for t-VATS ($p=0.94$). The IRR was 0% in both surgical approaches, comparing to 7.2% for the group of patients treated by simple drainage. Complications were observed in 'VAMT' group: 2 conversions to thoracotomy for technical difficulties (extensive pleural adhesences) and one case of re-thoracotomy for hemothorax. Mean Visual Analogic Scale (VAS) score for early post-operative pain was: 2.10 ± 0.71 for VAMT and 1.92 ± 0.64 for t-VATS, $p=0.42$ at t-student test. Paresthesia complain rate was 33.3% (VAMT) vs 30.7% (t-VATS) for moderate symptoms ($p=0.72$ at chi square test). The remaining patients complained only slight symptoms or no symptoms at all.

Conclusions. Our experience suggested that both surgical approaches to PSP are safe and effective. No differences were found for early post-operative pain and long term paresthesia rate, between the two approaches. No recurrence occurred during follow-up.

Effectiveness of transthoracic ultrasound in the thoracoscopic treatment of stage II - III pleural empyema

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Introduction. Optimal treatment of pleural empyema is still debated. Thoracoscopic approach is maybe the best choice in case of stage II and III empyema, especially because patients often have a poor performance status. But the presence of multiple loculations makes difficult the minimally invasive technique to be performed.

We wanted to evaluate the effectiveness of transthoracic ultrasound (TUS) in the planning of the best thoracoscopic approach to pleural empyema.

Materials and methods. From January 2007 to September 2012 26 patients with pleural empyema underwent preoperative transthoracic ultrasound. In 21 of them TUS showed a stage II empyema.

Patients were examined in surgical position. The presence and topography of loculations as well as the position and the course of the hemidiaphragm were described. Considering them, a small working window and a thoracoscopic access were drawn on the skin of the patient.

TUS accuracy was determined on empyema staging, topography of loculations and hemidiaphragm, and thoracoscopic accesses pianification.

Results. All patients underwent thoracoscopic treatment with a working window of about 10 cm and a second access of 10mm. In 4 cases (15,4%) open-conversion was necessary because of pathology extension.

Topography was correct in 24 cases (92,3%) and good thoracoscopic approach was achieved in 22 (86%). The presence of small and multiple loculations and a strong ipechoic effusion were the main causes of failure.

Conclusions. TUS is a very useful tool in the thoracoscopic treatment of pleural empyema. Its usefulness could further extend the use of thoracoscopy for the treatment of the pathology.

Electrocautery versus Ultracision versus Ligasure in surgical management of hyperhidrosis

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Objective. Aim of the study was to evaluate the sympathectomy procedures for primary hyperhidrosis in terms of complications and effectiveness.

Methods. From January 2010 to September 2012 we performed 130 sympathectomies in 65 patients, 27 males (42%) and 38 females (58%). Thirty-one patients (48%) had palmar, 16 (25%) palmar and axillary, 8 (12%) axillary, 6 (9%) palmar-plantar and 4 (6%) facial hyperhidrosis. Electocoagulation was used in 20 procedures (15%), ultrasonic scalpel in 54 (42%) and radiofrequency dissector in 56 (43%). Seven patients (11%) underwent bilater sympathectomy in same surgical session while in 58 (89%) the right surgical approach was delayed 30 days from the left.

Results. The length of surgery (18 ± 2 min) and hospital stay (1 day) were identical with the different techniques. We noticed 12 complications (9%): a) chest pain in 6 patients (4 with electrocoagulation, 1 with ultrasonic scalpel and 1 with radiofrequency dissector), disappeared in 20 ± 1 days; b) paresthesia in 3 electrocoagulation patients, was solved in 23 ± 5 days; c) bradycardia in 1 ultrasonic patient, normalized in 4th postoperative hour; d) recurrences in 2 electrocoagulation patients, positively treated in 1 patient by re-surgery in VAT. A questionnaire administered at 24 ± 1 month after intervention to assess the electrocoagulation, ultrasonic and radiofrequency clinical effectiveness showed respectively: a) an improvement of sweating in 90%, 98% and 98% of patients; b) enhancement of quality of life in 89%, 99% and 99% of patients; c) general satisfaction in 90%, 100% and 100% of patients.

Conclusions. The latest generation of devices offered greater efficacy in the treatment of hyperhidrosis, minimizing complications and facilitating the resumption of normal work and social activity of patients.

Thoracoscopic thymectomy: does an extensive experience in open procedures is needed?

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Introduction. Open surgical approach is considered the standard procedure in the treatment of thymic diseases; however, in recent years, VATS thymectomy has been reported as an effective and technically sound treatment for benign mediastinal tumors and early stage thymomas. The purpose of this study was to explore the initial learning curve for a surgeon rather inexperienced in open thymic surgery.

Materials and methods. We evaluated the learning curve in thoracoscopic thymic surgery of a surgeon inexperienced in open thymic surgery but highly trained in thoracoscopic lung resections. Perioperative data (procedure time, blood loss and possible complications), length of hospital stay, postoperative complications and long term outcome were collected.

Results. During a 6-year period, from 2006 to 2012, 41 patients underwent thoracoscopic resection of mediastinal lesions: all the procedures were performed during close expert supervision using a standardized three-port endoscopic technique, mostly left-sided. Twelve (29%) patients were affected by thymoma while 29 (71%) were affected by benign thymic tumors. Only one procedure (2%) was converted to open thoracotomy, while one case with left innominate vein injury was controlled without converting to thoracotomy. Operating time as well as mean intraoperative blood loss amounts were related to the improvement surgeon experience. Mean hospital stay was 3.2 days, three patients had transient phrenic nerve (7%) and 2 (2.5 %) patients were admitted to the hospital 30 days after surgery for sepsis.

Conclusions. With thorough training on selected patients and under close supervision good surgical results can be achieved even if the surgeon has limited prior experience in open mediastinal tumor surgery.

Transitional-development program towards the future through a gradual learning curve: from an open lobectomy to a toracosopic one

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Aim. The introduction of a new technique and the transition to a consolidated practice involves a process of surgical training and a learning curve. We show our educational training program, the ultimate goal is to perform all lobectomies for pulmonary neoplasia by VATS (Video Assisted Thoracic Surgery).

Materials and methods. Since December 2011 we have run training courses on VATS lobectomy. In February 2012 we started our activity. An anterior approach to the hilum has been used, introducing a 5 cm utility incision. The conceived approach of the program selected by the school it includes an initial phase of just lower lobes in patients with peripheral lung cancer; we performed a lymph node sampling. We have set an initial goal of 20 lower lobectomies, and then, acquired the necessary familiarity and completed the learning curve, perform all other resections.

Results. From February 2012 to August 2013 we performed 98 major lung resection: 81 lobectomies, 9 segmentectomies, 8 pneumonectomies. 25 patients underwent VATS lobectomy; more specifically, 16 males and 9 females, with a mean age of 65.7 years (43-79); 66% of patients had a history of previous cancer; of the removed lobes: 6 were lower right, 15 lower left, 1 medium, 2 upper right, 1 left upper.

The conversion rate was 8% (n = 2): a case of hemorrhage, the other one for failure in finding a second not omolobar nodule.

Mean duration of surgery was 180 minutes (95-415). The mean number of lymph nodes sampled was 11. Final histology, we found a overstaging "N" in 13% of cases (n = 2).

The drainage was kept on average 3.8 days (2-10). The epidural catheter was placed in all patients. Median duration of postoperative hospitalization was 4 days (3-16). The visual analogue scale used to assess pain had an average value 3. The 30-day mortality was 0%. We observed no major complications, whereas in 6 cases (24%) we observed minor complications (atelectasis from

bronchial obstruction n = 1, pneumonia n = 2, n = 1 atrial flutter, drug induced allergy = 1, n = 1 prolonged air leak).

Conclusions. VATS lobectomy is a safe and standardized procedure by now.

Our specific introducing protocol of this methodology entails a progressive learning curve, using an anterior approach to the patient. The short-term benefit for the patient is encouraging.

It has been demonstrated that VATS lobectomy should by now be part of the of the cultural and technical skills of any credited Thoracic Surgery Center.

Endoscopic treatment of endobronchial carcinoid after ultra-selective artery feeders embolization

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Objective. The bronchial carcinoid tumors are unusual neoplasms presenting an indolent clinical behaviour, rarely aggressive and in most cases with a favourable outcome. They are highly vascular mass, and approximately 75% arise in the main airways. The surgery represents the gold standard in the treatment of carcinoid tumors, the bronchoscopic debulking of the tumor should be reserved in inoperable cases, for accurate assessment of its extent and of the bronchial tree downstream of obstruction. The aim of this study was to assess the safety, effectiveness and benefits of the ultra-selective artery feeders embolization.

Methods. Five consecutive patients underwent endoscopic treatment for bronchial carcinoid tumors between January 2010 and December 2012. There were 3 males and 2 females, the mean age was 58, ranging from 35 to 74 years old. In 3 patients the airways were disobliterated prior to surgery; other 2 patients were unfit for surgery. All patients underwent bronchial arteriography and bronchial artery embolization. Within the next 48 hours, we took the patients to the operatory room

where they underwent rigid bronchoscopy under general anesthesia. We removed the lesion by mechanical resection and completed the treatment by low power Nd:Yap laser photo-coagulation. A bronchoscopic evaluation was performed on day 1 and 15.

Results. In all patients an almost complete disappearance of the tumour blush was achieved. There were no procedure-related complications. During and after the endoscopic treatment no hemorrhagic complications neither respiratory failure were observed. The patients were discharged in three days, after a bronchoscopic evaluation on day 1 that confirmed the complete macroscopic removing of the lesion and no evidence of bleeding. Afterwards 3 patients underwent surgical treatment. In these patients the definitive pathological examination confirmed a completely absence of residual tumor in the bronchial wall removed.

Conclusions. Even if surgery represents the gold standard in the treatment of carcinoid tumors, a multi-disciplinary approach involving surgeon, interventional radiologist and bronchoscopist should be considered for selected patients. The ultra-selective arterial feeders embolization is feasible, safe and reduces the bleeding risk during and after the endoscopic procedure.

Use of Beriplast® in the treatment of bronco-pleural fistula after bronchial suture or bronchoplastic anastomosis

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Objective. Beriplast® (Trombin + Fibrinogen) may have potential application in the endoscopic management of bronchial suture dehiscence.

Materials and methods. A retrospective study on patients affected by postoperative Broncho-Pleural Fistula (BPF), managed by Beriplast® instillation through Fiberoptic Bronchoscope, has been carried out. The following data have been considered: type of surgical resection, fistula dimensions and time of occurrence, indications for endoscopic treatment, comorbidities and the clinical setting in which the dehiscence occurred. The

recordings of the endoscopic treatments have been collected (Endobase software). Clinical and oncological follow-up has been updated.

Results. Three cases of BPF following major lung surgery for neoplasia and bronchiectasis have been treated with Beriplast®. The procedures consisted in two right lower lobectomies and one carinal sleeve pneumonectomy. In two cases the fistula occurred early in the post-operative period, while in one case of right lower lobectomy, the fistula was diagnosed at four months from surgery (comorbidity: HCV Chronic Hepatitis; Surgical indication: lung cancer). The dehiscence was minimal (diameter < 3 mm) in all cases at fiberoptic examination. The clinical records showed fever in 3/3 cases, omolateral pleural effusion in the two lobectomy cases and radiological signs of infection of the right pleural cavity in the pneumonectomy case. Tube thoracostomy was carried out in 2/3 cases, while the thoracic drainage was kept in site in the third case.

Beriplast® instillation was performed once in 1/3 patients, while it was multiple (3 and 4 applications) in the remaining 2 cases. Time lapse between treatments varied

from 5 to 30 days. In the late-onset case, after 2 unsuccessful instillations, the patient underwent surgical debridement of the pleural cavity, surgical closure of the fistula and suture buttressing with omental-flap, laparoscopically performed. Due to metabolic impairment secondary to the chronic hepatitis, further 2 instillations of Beriplast® have been carried out to seal a minimal recurrence of the fistula.

At follow-up (16, 12 and 6 months respectively) all patients are free from primary disease (2/3), bronchiectasis symptoms are absent (1/3) and there is no post-surgical morbidity.

Conclusions. Mainstays of BPF treatment are local drainage and fistula closure. In some circumstances surgery cannot be avoided: large huge fistulas and regional vascular insufficiency. When conservative therapy is possible (small fistulas) the application of Beriplast® is warranted as it can be repeated and is not mutually exclusive with other methods of repair.

Beriplast® is a reliable product, easy to apply and capable of attending optimal results in the case of small bronchial dehiscence.