

THORACOPLASTY, AN EXPERIENCE OF 513 CASES OVER 12 YEARS PERIOD IN A DEVELOPING COUNTRY

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ABSTRACT

OBJECTIVE: To assess that thoracoplasty is not an obsolete procedure, and is still a useful space obliterating collapse procedure.

MATERIAL AND METHODS: This retrospective observational study was conducted in Thoracic surgery unit Lady Reading Hospital, Peshawar from Jan 2003 to Nov 2014. Patients who had thoracoplasty done as a collapse therapy in these 12 years were included in this study. Total number of patients who underwent this procedure were 513. Patients who had other space obliteration procedures like muscle interposition, pleural tenting, were excluded from the study. The demographic data, operative findings, outcome of procedure in terms of postoperative complications, 30 day mortality and duration of ICU and hospital stay were recorded from the data base of patients record of the ward.

RESULTS: Our study included 360 male and 153 female patients, age ranges from 12 years to 70 years (Mean age 31 years) out of 513 patients 310 had complete thoracoplasty, while 203 had partial thoracoplasty. In 490 patients thoracoplasty was done as a space obliterating collapse therapy, while in 23 patients patients were not fit for resectional surgery and having hemoptysis or MDR TB. Morbidity was 29 (5.65%) patients, three patients had complete breakdown of wound, 17 patients had wound infection, 2 patients with partial thoracoplasty were re-opened to do complete thoracoplasty and 7 patients had persisting sinus. Mortality was 11 (2.14%), three patients did not recover from anesthesia, and 8 of them had persistent sepsis, septicemia and cachexia. Mean ICU stay was 2 days and mean hospital stay was 5 days.

CONCLUSION: There is still a role for this obsolete procedure in selected cases of persistent infected pleural space, with little or no viable lung tissue.

KEY WORDS: Thoracoplasty, Decortication, collapse therapy.

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INTRODUCTION

Thoracic surgical centers all over the world are performing thoracoplasty in continuously decreasing numbers. In fact, it has even been described as an obsolete procedure. However, in Pakistan, the original indication of this operation, viz. pulmonary tuberculosis remains rampant.

After the advent of chemotherapy for pulmonary tuberculosis, the operation of thoracoplasty became rare in the developed countries. However, this was not the case in developing countries like ours.

The operative removal of the skeletal support of a portion of the chest is called thoracoplasty. It is usu-

ally accomplished by subperiosteal removal of varying number of ribs or rib segments to approximate the chest wall to the underlying lung or mediastinum to effect lung collapse or pleural space obliteration. As thoracoplasty is somewhat mutilating, it is always carried out as a last resort. In our institution, thoracoplasty is carried out for a few specific indications.

Indications for the procedure are attempts to close persistent pleural spaces with and without infection and bronchial fistulae, both post-resection and in association with post pneumonic pleural suppuration. These indications are seen in limited numbers by western thoracic surgeons. Our experience suggests that a fairly large number of such patients exist in our community who are not suitable for decortication and could benefit

from thoracoplasty. The purpose of every extrapleural thoracoplasty of whatever degree is to close cavities and to put the diseased lung at rest. It is not directed toward limiting the function of an undamaged lung. Too often, in the collapse of any cavity, some good lung tissue is compressed. selective thoracoplasty does the least amount of damage to healthy lung tissue.

Thoracoplasty can also be done in selected patients of lung resections who are not fit for surgery due to poor lung reserves and having MDR TB or heamoptesis due to some cavitating lung deases.

MATERIAL AND METHOD

This retrospective observational study was conducted in Thoracic surgery unit Lady Reading Hospital, Peshawar from Jan 2003 to Nov 2014. 513 patients underwent thoracoplasty at Lady Reading Hospital, Peshawar. There were 360 men and 153 women whose age ranged from 12 years to 70 years (Mean age 31 years). Out of 513, complete thoracoplasty was done in 310 patients, while 203 had partial. [table no1]

Out of 310 complete thoracoplasties, 65 were done for failed decortication, 182 had been done primarily instead of decortication with non expending lung, 40 had post resectional space infection with 23 having bonchopleural fistula, 15 had destroyed lung with he-moptyses and poor PFTs, and 08 patients were MDR TB with poor lung functions. Of the 203 partial thoracoplasties, 130 were combined with decortication, 30 had failed decortication, and 43 had post lobectomy space obliteration.

Pre-operative preparation of patients for thoracoplasty consisted of standard measures including adequate drainage of the empyema space till the discharge became minimal, improving the nutritional status of the patient, pulmonary function studies and bronchodilators, if necessary, cover of anti-tubercular drugs for at least six weeks in cases of pulmonary tuberculosis, and antibiotic treatment as dictated by pus culture and sensitivity reports.

Double-lumen endotracheal tube was used in all

cases. A standard posterolateral thoracotomy incision as per the required length was given. This was followed by opening the empyema cavity by incising the layer of thickened pleura with electrocautery. Extent of the empyema cavity became clear at this stage. The number of ribs that need to be resected was determined by judging the extent of the space. After resecting each rib, the underlying thickened pleura was incised with cautery along the full length of the empyema cavity. Thus, the entire intercostal bundle fell into the empyema cavity. Back ends of the ribs were always resected completely first rib was always preserved. In patients with bonchopleural fistula, direct suture was attempted and, if necessary, a myoplastic flap created from intercostal muscles and adherent thickened pleura was sutured all around the fistula.

Compression pads placed in axillary and anterior pectoral folds. The aim of compression was not only to minimize accumulation of blood but also to prevent any paradoxical movement of the chest wall in the post-operative period. Sufficient analgesia with narcotic drugs was maintained in the post-operative period. Physiotherapy in the form of active breathing, incentive spirometry and active shoulder movement was encouraged. Appropriate Antibiotics and low pressure suction applied.

Eight patients had MDR TB and were having poor lung functions they were MDR negative after this procedure.

RESULTS

503 patients underwent thoracoplasty at Lady Reading Hospital, Peshawar. There were 360 men and 153 women whose age ranged from 12 years to 70 years (Mean age 31 years).

Out of 503 patients who underwent thoracoplasty, 31 patients developed postoperative complications. Sixteen patients had post-operative wound infection which increased morbidity (Table no.2). In one patient, there was a complete breakdown of the wound and recovery took about two months. In four patients empyema space persisted after partial thoracoplasty and a

Table 1:

M:F	360:153
Age:	12-70 (Mean 31 years)
Complete Thoracoplasty	310
Partial Thoracoplasty	203

Table 2: Morbidity(31/503)

Morbidity	31
Complete breakdown of the wound	01
Wound infection	15
Re-operation	04
Persisting sinuses	07

Table 3: Mortality(11/503)

Mortality	11
Early	03
Late	08 (due to persistent sepsis)

re-do complete thoracoplasty was done. Sinuses continued to persist in seven patients.

Twenty three patients, who had pre-operative bronchopulmonary fistula, post resectional surgery had an uneventful post-operative course. As detailed earlier, intercostal muscle bundles were used to support the repair of the fistula.

Fifteen patients achieved control of recurrent haemoptysis occurring from post-tubercular upper zone cavities. These patients were not taken up for resectional surgery because of the bilateral nature of fibrotic nodules. and poor PFTs.

Eight patients had MDR TB and were having poor lung functions they also underwent this procedure all became MDR negative.

There were Eleven deaths in the entire series (Table 2). Three early death both did not recover from anaesthesia, and Eight deaths were caused by persistent sepsis, septicemia and cachexia.

DISCUSSION

Thoracic surgery unit at Lady Reading Hospital Peshawar is a 36 bedded tertiary level referral center for whole of KPK and Afghanistan. 503 thoracoplasties were performed in 12 years.

The main indications for thoracoplasty which we performed in our unit were.

Space obliteration in cachectic patients these patients had either decortication done previously which had failed, giving rise to persistent infected space or else had a post pneumonectomy space infection and other more conservative measures like drainage and stoma had failed. As our experience with the technique grew we started doing thoracoplasty primarily

for empyema patients whose lung on the table, after full mobilization, did not inflate sufficiently to obliterate the space. In these cases as we anticipated a residual space, and the nutritional status of the patient was not conducive to muscle flaps, we did either a complete thoracoplasty or combine decortication with partial thoracoplasty. This in no way reduces the role of decortication. The best thing to fill the pleural space is expanded lung tissue. If the lung is functionally deficient and can not fill the space then next best are muscle flaps. If the patient is nutritionally sound and has sufficient muscle tissue; if that too is not available then in a very selected group of cachectic patients with persistent infected spaces we advocate thoracoplasty.

Patients with totally or partially destroyed lungs and poor lung functions, and hemoptysis. Ideally these patients need a lung resection either in the form of lobectomy or pneumonectomy, and this is what most patients had. However again there was a specific group of patients who on top of hemoptysis due to destroyed lung, had very poor pulmonary reserve and were not fit for lung resection. In these select group of patients we resorted to collapse therapy, in the form of partial or complete thoracoplasty. The collapse therapy resulted in collapse and fibrosis of the affected lobe or lung resulting in symptomatic relief. It is again emphasized that the primary treatment for hemoptysis due to destroyed lung is lung resection, either lobectomy or pneumonectomy, and not thoracoplasty. Only in those few selected cases where the pulmonary reserve is insufficient for a lung resection, should thoracoplasty be considered.

Patients with MDR TB and they were not fit for General anaesthesia due to poor lung functions had very good results, became MDR negative after thoracoplasty.

The operative removal of the skeletal support of a portion of the chest is called thoracoplasty. It is usually accomplished by subperiosteal removal of varying number of rib segments to approximate the chest wall

to the underlying lung or mediastinum to effect lung collapse or pleural space obliteration². This operation has evolved along two lines : (i) the Alexander procedure which successfully collapsed the cavities of pulmonary tuberculosis and was used until it was supplanted by antimicrobial therapy and pulmonary resection, and (ii) the Schede procedure which aims at reducing intrathoracic spaces or filling them with living tissue implants. These indications for the operation of thoracoplasty are continuously decreasing as is evident from many published reports^{3,4,7}. However, pulmonary tuberculosis and its complications are quite rampant in Pakistan. There are associated problems caused by poor patient compliance, drug resistance, poor health care delivery system and a certain amount of mismanagement at primary and secondary levels of health care.

Various surgical procedures, mostly developed in the days of surgery for tuberculosis before the advent of antituberculous chemotherapy, have been reported. Resection procedures in the presence of previous chronic lung disease are fraught with complications, such as persistent air leak, bronchopleural fistula, and space infection resulting from the non-expansion of the fibrotic residual lung. Technically the procedures are complicated and difficult because of the extensive induration and fibrosis. As a result of the poor general health of the patients and their immunocompromised state the postoperative period is often complicated by infection. Consequently the mortality of such procedures has been as high as 34%.¹³ Lesser procedures such as thoracoplasty, and muscle transposition have therefore gained popularity as either an initial or a concomitant procedure.

The operation is used for the treatment of chronic thoracic empyema when there is either insufficient or no remaining pulmonary tissue to obliterate the pleural space. If the lung cannot be brought to the chest wall [which is the objective of tube thoracostomy, rib resection and decortication), the chest wall must be brought to the lung (or the mediastinum if no lung exists)^{1,5,7}. In 1985, Hopkins and Co-workers⁶ reviewed their experience with thoracoplasty. Our experience suggests that a fairly large number of such patients exist in our community who are not suitable for decortication and could benefit from thoracoplasty. Today, thoracoplasty as an operation for management of chronic pleural empyema is accomplished in one stage.

Harrigan⁸ in his study also proposed the use of thoracoplasty in infected pleural spaces in 1990. Phillip⁹ in 1999 reported his experience of 23 cases of thoracoplasty in post pneumonectomy empyema, Treasure¹⁰ in 1995 advocated the use of thoracoplasty in resistant TB, Jaretzki¹¹ in 1991 advocated the use of thoracoplasty in selected cases of chronic empyema, as did Ali and Pailoreo¹² in 1991.

CONCLUSION

This is not an obsolete procedure. In a high TB burden country like Pakistan and ever increasing MDR, it is indicated and gives good results for (1). Infected space

- (2). Symptomatic destroyed lung with poor reserves
- (3). MDR with poor lung function.

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