Indications and complications of tube thoracostomy performed by general surgeons

Tariq Wahab Khanzada, Abdul Samad
Department of Surgery, Isra University Hospital, Hyderabad.

Abstract

The cross-sectional study conducted at the Isra University Hospital, Hyderabad was to determine the frequencies of various indications and complications of tube thoracostomy performed by general surgeons between February 2003 and January 2006. The data was analyzed and compared with other local and international studies. One hundred and five tube thoracostomies were performed over the above mentioned last three years. The most common indication for tube thoracostomy was tuberculous effusion (38/105, 36.1%). Most of the complications were categorized as positional complications and these occurred in about 9.5% (10/105) of the patients. Insertional complications occurred in 5.7% (6/105) of the patients whereas infective complication was noticed in only one patient. The most common complication was non-functioning of tube and this occurred in about 7.6% (8/105) of the patients. Tube thoracostomy is a relatively simple but invasive procedure and carries less risk of complications if performed carefully and cautiously.

Methods and Results

This is a cross-sectional study of all patients undergoing tube thoracostomy at Isra University Hospital, Hyderabad from February 2003 to January 2006. Proforma was completed at the time of procedure and patients were followed for six months or till referred to other centre. The proforma was filled by the surgeon performing the procedure.

All tube thoracostomies were planned under local anaesthesia except special circumstances. The written informed consent was taken from patients before the procedure. The adopted procedure for local anaesthesia was 1% lignocaine (at a dose of 3mg/Kg) infiltrated into the skin, subcutaneous tissue, periosteum of the rib and underlying pleura. The same needle was used to aspirate air or fluid to confirm the entry into the chest. After entering the pleura with artery forceps, a finger was used to sweep the inside of the pleural cavity and to clear any adhesions. Then the tubes were placed by large artery forceps. No tube thoracostomy was performed by using trocar. Tubes were secured by using a non-absorbable suture and a second purse string suture was placed loosely for tying at the time of tube removal. For effusions and empyema, size 28 and 32 Fr tubes were commonly used and were placed basally. For pneumothorax, size 20 and 24 Fr tubes were commonly used and were placed apically.

The complications were categorized as insertional (for example, lung or other organ laceration or perforation, haemorrhage), positional (for example, extra thoracic placement, persistent haemothorax or pneumothorax) or infective (for example, minor wound infection or empyema thoracis).

The collected data was entered in SPSS 11.0 software program. The data was analyzed for the frequencies with special reference to indications and complications.

About 105 tube thoracostomies were performed during the above mentioned period. The mean age was about 54 ± 12.12 years with the range of 8 to 77 years.

The indication for most (72/105, 68.5%) of the tube thoracostomies was effusion and most of these patients were referred from Medicine department for tuberculosis related effusion.

Introduction

Tube thoracostomy is a very frequently performed procedure by general surgeons as well as pulmonologists across the world. It is performed for a number of disorders including thoracic trauma and provides definite treatment in majority of thoracic trauma cases. Tube thoracostomy is a simple but invasive and frequently life saving surgical procedure. This carries a significant complication rate reported as between 2% to 10%.\textsuperscript{1,2} The literature review has shown many insertional, positional and infection related complications after tube thoracostomy especially after acute trauma.\textsuperscript{3}

The overall complications rate reported is 25% to 30% in other studies. Chest tube malpositioning was found to be the most common complication of tube thoracostomy in literature review.\textsuperscript{4,5} Some rare complications like delayed perforation of esophagus\textsuperscript{6}, abdominal placement\textsuperscript{7}, and contralateral pneumothorax\textsuperscript{8} have also been reported.

The objective of this study was to determine the frequency of various indications and complications of tube thoracostomy performed by general surgeons at Isra University Hospital, Hyderabad.
complications. The other indications were pneumothorax (22.85%) and hydropneumothorax (8.5%). Road traffic accident was the commonest cause of the pneumothorax. The detailed account of indications is mentioned in Table.

The mean duration of placement was about 6 ± 2.06 days with the range of 2 to 14 days. One patient had persistent air leak for more than 2 weeks and was subsequently referred to Thoracic Surgery unit of another tertiary Care Centre.

Except for one, all other tube thoracostomies were performed under local anaesthesia. The only procedure done under monitored anaesthesia was an 8 years old child with pleural effusion.

Insertional complications were noticed in 6 patients (5.7%). Five of these six patients had surgical emphysema which resolved spontaneously within few days. One patient had severe per operative bleeding from the site of insertion. The bleeding was from incision site and was controlled by sutures. This patient was a known case of rheumatoid arthritis and was on regular steroids.

The positional complications made the major bulk (9.5%) of complications in this study. These include non functioning tube thoracostomy (8/10), extra pleural placement (1/10) and persistent air leak (1/10). The problems of eight nonfunctioning thoracostomies include kinking (6), clotting (1) and dislodgment (1). Kinked tubes were repositioned by pulling the tube out and position was reconfirmed by chest radiograph. No further intervention was required. One non functioning tube had clotted blood which was milked down and tube started working and another tube was accidentally dislodged from pleural space. This was placed for spontaneous pneumothorax. Post dislodgment radiograph showed adequate lung expansion so no further intervention was done.

In one patient, thoracostomy tube was not placed in pleural space as this patient was very obese with thick chest wall. Tube was then positioned in the pleural space. The infective complication was noticed in one patient. This was a superficial surgical site infection and responded well to the combinations of antibiotics and dressings. The rarity of infective complications is comparable to other studies. None of the patients developed major infective complication i.e. empyema thoracis after tube thoracostomy. None of the rare complications like delayed perforation of oesophagus, abdominal placement and contralateral pneumothorax were observed in this study.

Conclusion

The tube thoracostomy is a simple but invasive and frequently life saving procedure. If the procedure is performed with appropriate care and adequate post operative care is provided, then the chances of developing complications are minimal and most of these are easily curable.

References