THORACOSTOMY TUBE DRAINAGE PROCEDURE A LIFE SAVING SURGICAL PROCEDURE

Introduction to Gambhir Thoractostomy Tube forceps & an analysis of 100 cases of thoracostomy Tube Drainage Procedure Operated at Shree Birendra Hospital.

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Introduction :

This is an Emergency Life Saving Surgical procedure done to relieve respiratory distress (embarrassment) caused by collection of large volume of air (Pneumothorax), blood (Haemothorax), and air and fluid (Haemo-pneumothorax/pyo-preumothorax) in the pleural space in chest cavity (Thoracic Cavity) there by compressing the underlying Lungs. (1)

This Emergency Surgical procedure is carried out to relieve both medical diseases (Tension pneumothorax) and surgical diseases eg, post traumatic Haemo-pneumothorax. (2)

This is an Emergency Surgical procedure which every medical professional at all level should be able to carry out for relief of respiratory distress following Tension Pneumothorax and Haemopneumothorax, at all levels of medical set up and round the clock. (3,4,5)

Indications (6,7,8)

Medical -Tension Pneumothorax
Acute Empyma
Malignant Pleural Effusion
Chylothorax
Pyopneumothorax
Broncho Pleural fistula

Surgical

Thoracic (Chest)

Trauma Causing, Haemo Thorax
Tension Pneumothorax
Haemo Pneumothorax

Iatrogenic

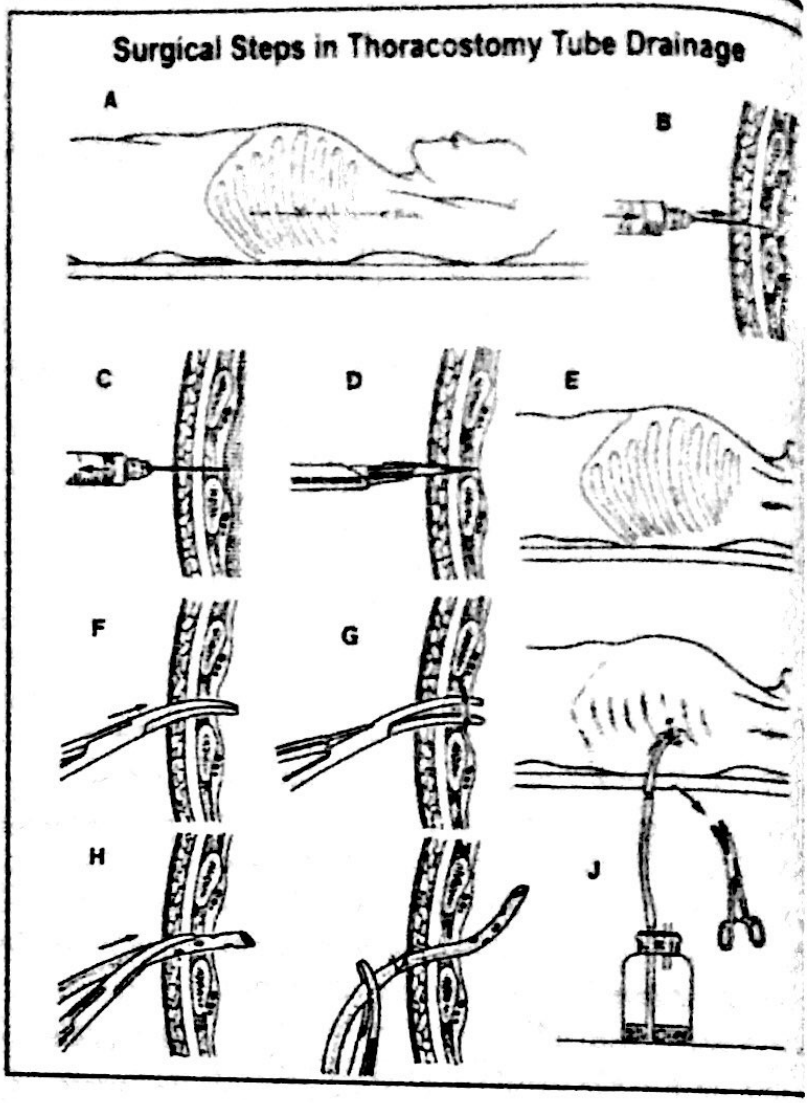
Following, Pleural Biopsy
Lung Biopsy
Endoscopy eg, Oesophagoscopy
Vascular Cannulation eg CVP line insertion

Different types of Surgical Equipments available for Thoracostomy Tube drainage procedure (1)

1. Tudor Edward Trocar and Cannula
2. Argyle Thoracic Catheter and Trocar
3. Malecot or De Pezzer Catheter with introducer
4. Trinkler tube with introducer
5. Large Curved Artery forceps (Dissection technique)
6. Gambhir Thoracostomy Tube forceps

The No. 1,2,3,4 instruments are not much in surgical use these days, due to risk of injury to underlying lungs & organs during insertion of chest tube. The usual surgical procedure these days is by dissection technique with Curved Artery forceps. (4)

SURGICAL STEPS IN THORACOSTOMY TUBE DRAINAGE BY DISSECTION TECHNIQUE (1,8)



1. **Position of the patient**

   The most comfortable position for the patient is semi-supine

   The thoracostomy tube should be inserted n 5th or 6th intercostal space in mid axillary line just posterior to pectorals major muscle.

2. **Anaesthesia**

   After cleaning the skin with 1% providence iodine. Inj. Lignocane 2% is infiltrated into the skin, subcutaneous tissue and underlying intercostal muscles.

3. **Incision**

   A 2 cm incision in made through skin & Subcutaneous tissue parallel to intercostal space along the upper border of rib.

4. **Dissection**

   A tract is made through the underlying intercoastal muscle by blunt dissection using a pair of large curved artery forceps.

   The dissection is continued

   Until pleural cavity is opened (intervened).

5. After making an opening in pleural cavity the artery forceps in withdrawn.

6. Chest tube is introduced (pushed) gently into pleural cavity with the help of large curved artery forceps.

7. After the placement of chest tube the artery forceps is withdrawn. Chest tube is connected with water seal drainage system. Chest tube is fixed with chest wall in an appropriate place with silk suture. A silk purse string suture is applied to close the wound while removing the chest tube.

Satisfactory placement of chest tube is checked with fluctuation of water level in water seal bottle. Proper placement of chest tube rechecked with X-ray chest.

Gambhir Thoracostomy tube forceps

This is a modified large curved artery forceps make insertion of chest tube drainage easier, quick and safer in the thoracostomy tube drainage surgi procedure by dissection technique.

This is a large curved artery forceps which h concave grooves at it's fore blades with serrati in it's inside fore blades, modified to accommod the chest tube while inserting inside the pleu cavity.

There is a gap between the fore blades accommodate chest tube, even when tips of the fo blades are closed.

This forceps can firmly hold chest tubes with fore blades with its tips (beak) closed duri insertion of chest tube.

This forceps makes easier, quicker and saf insertion (introduction) of chest tube duri thoracostomy tube drainage procedure. This forc reduces usual three 3 steps surgical procedure single step surgical procedure.

Thoracostomy Tube Drainage
(Water Seal Chest Tube Drainage)
A Life Saving Surgical Procedure

Gambhir Thoracostomy Tube Forceps

The same Thoracostomy tube forceps will enter the pleural space and carry along with it chest tube into pleural space and will place the chest tube in pleural space in single surgical step.

In usual surgical procedure with large curved artery forceps having 3 steps

1st step entering the pleural space.

2nd step enlarging the pleural hole and removing the forceps

3rd step introducing the forceps with chest tube, with artery forceps with it's wide open tips.

With this usual procedure it takes

1. more time
2. more painful for patients
3. difficult procedure for surgeon

During the reinsertion of forceps along with chest tube it is usually difficult to find the old pleural hole due to bleeding and discharge of fluid in the surgical field in acutely respiratory distressed patient with curved artery forceps with it's wide open tips.

Thoracostomy tube drainage procedure with this new Gambhir Thoracotomy tube forceps makes the thoracostomy chest tube drainage surgical procedure -

1. Very convenient for surgeon
2. Time saving by reducing 3 steps to a single step
3. Less Traumatic and less painful to patient
4. Safer surgical procedure

With this Gambhir thoracostomy tube forceps chest tube can be inserted in pleural cavity with chest tube firmly hold up with its tips closed (Beak closed) in single step (instead of 3 steps)

With introduction of this simple modified Gambhir Thoracostomy tube forceps medical professionals of all levels and at all levels of medical set up will be able to perform emergency thoracostmy tube drainage procedure safely in less time, in easy way with less pain to the patient for relief of acute respiratory distress.

I hope with time the instrument shall be made available in different sizes for clinical useless in hospitals for thoracostomy tube drainage surgical procedure and shall be utilized by our professional colleagues for the benefit of acutely respiratory distressed patients.

Analysis of 100 cases of Thoracostomy Tube Drainage Surgical Procedure Operated at Shree Birendra Military hospital.

Shree Birendra Military Hospital is a 400 bedded referral hospital with all medical and surgical facilities including MRI. It provides medical services to regular army, retired army & their family members & including civilian trauma patients. This hospital has got Cardio-Thoracic Surgical Unit, which is performing regular thoracic & closed cardiac surgery since 2051 BS (1994 AD).

During last 5 years 2051 to 2056 BS, 100 cases of Thoracostomy Tube drainage surgical procedures

were performed under Cardio-Thoracic surgical unit for relief of Medical and Surgical diseases. This study will briefly analyse those cases retrospectively.

This study included 50 cases referred from medical department and 50 surgical cases. Their age range from 5 years to 76 years in medical group and 20 years to 75 in surgical group. In the surgical group out of 50 surgical cases of Thoracostomy Tube Drainage procedure, 40 cases were following blunt Chest trauma (24 Following road Traffic Accident & 16 had fall from height). 7 cases had penetrating chest injury (2 following bullet injury & 5 had stab injury chest). 2 cases had bomb blast chest injury. One case had iatrogenic Pneumo-thorax following Nephrectomy operation.

Out of 50 surgical patients under going thoracostomy tube drainage 25 had pneumothorax, 20 had haemothorax & 5 had haemopneumothorax. Out of 50 surgical cases of thoracostomy tube drainage, 4 cases required Thoracotomy due to excessive haemorrhage with chest tube drain more than 250 ml. blood in successive 3 hours. There was one death in surgical group of 75 years old man with blunt chest injury with COPD. (9)

Out of 50 medical cases undergoing Thoracostomy Tube Drainage.

20 cases had Tension Pheumothorax, (3 cases had no obvious lung disease, 11 cases had COPD & 4 cases with recurrent pneumothorax had COPD & 2 cases had Pulmonary TB). 16 cases had Acute Empyma Thoracic following PNUEMONIA. 8 cases had massive pleural EFFUSION (5 cases had Malignant pleural effusion, 3 cases had tubercular effusion)

6 cases of Hydro Peumothorax (4 following rupture of lung Abscess & 2 following rupture of Hydatid Cyst of lungs)

The commonest complication following Thoracostomy Tube Drainage was surgical emphysema due to accidental clamping of the chest tude in COPD patients. There was one death of 76 years old lady with severe COPD with bilateral pneumothorax among 50 cases of medical cases undergoing thoracostomy tube drainage procedure. (10)

All the 100 cases under going thoracostomy tube drainage surgical procedure had local anesthesia with Inj. 2% Lignocain infiltration & operated by Dissection Technique with large curved artery forceps. Since last one year 1999 AD we have been using modified Gambhir Thoracostomy Tube Forceps & have used the instrument in last 20 cases. The use of Gambhir Thoracostomy Tube Forceps has made thoracostomy Tube drainage surg fater, safer & easier to surgeon & less painf comfortable to patient. There were no immed surgical complication following use of Gamb Thoracostomy Tube Forceps. All the patient parenteral antibiotic coverage & there were infective complication.

Conclusion:

Thoracostomy Tube Drainage Surgical Proce is a life saving Surgical procedure which has ranging application for the relief of acute respira distress patients following many surgical & med diseases. This is a surgical procedure which sho be available at all level of medical facilities, a the time & all the medical officers should efficient to perform the surgery.

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