SUMMARY AND CONCLUSION

This essay deals mainly with reconstructive surgery of the trachea. The history of the tracheal surgery was divided into three historical periods. The first period began basically in the 19th century and continued to the end of that century. The second period included the first half of the 20th century and the third period began from the fifties of this century.

The embryogenesis of the trachea, bronchi and the lungs is closely related to the development of the alimentary tract. Some defects such as tracheoesophageal fistula occurs when there is imperfect embryogenesis.

The trachea is located in the middle line and its distal part is quite displaced to the right. The internal diameter of the trachea in adult is 2.3cm. laterally and 1.8cm. anteroposteriorly.

The are many tracheal lesions that require reconstruction such as :

(1) Congenital malformation of the trachea.

(2) Tracheal injuries.

(3) Inflammatory diseases of the trachea.

(4) Tracheoesophageal fistula.

(5) Stenosis of the trachea.

(6) Tumors of the trachea.

The main clinical presentation of the tracheal lesions are cough, dyspnea, stridor, hemoptysis and change in voice.

In congenital stenosis of the trachea and other obstructive anomalies the diagnosis is based on a high degree of suspicion in infants with respiratory distress.

Most of the tracheal injuries manifest themselves as obstructive lesions of the trachea. The presence of mediastinal and subcutaneous emphysema without pneumothorax is typical of tracheal rupture.

Other injuries such as tracheoesophageal fistula due to cuff erosion usually manifests by increasing difficulty in ventilating the patient, gastric dilatation or more often, the sudden appearance of large amounts of secretions in the tracheobronchial tree.

Symptoms of tracheal tumor may occur in several ways, the most frequent and relatively early is cough which intensifies when the patient changes his position with dyspnea and stridor.

The diagnostic techniques for tracheal lesions are variable and include the following :

(1) X-ray examination.

(2) Fluoroscopy.

(3) Tomogrphy..

(4) CT scan and MRI

(5) Tracheography.

(6) Bronchoscopic examintion.

In tracheal reconstructive surgery the following general principles are following :

(1) General anesthesia including special techniques according to each lesion.

(2) Surgical approach which includes :

- Anterior collar incision.
- Median sternotomy.
- Posterolateral thoracotomy.

(3) Suture material.

Several authors have investigated the use of different suture materials in tracheal reconstruction. There are many kinds of sutures that can be used, e.g. either absorbable or nonabsorbable, with the absorbable materials being better, as they cause little or no granulation tissue at the site of anastomosis.

In the management of tracheal lesions, a conservative treatment can be applied according to the pathology. These modalities of treatment include :

(1) Dilatation.

(2) Diathermy coagulation, cryotherapy, and electrosurgery.

(3) Laser therapy.

(4)Brachytherapy

The indications for tracheal resection are :

(1) Primary tracheal tumors.

(2) Secondary tumors of the trachea.

(3) Postintubation stenosis of the trachea.

(4) Congenital anomalies of the trachea.

(5) Blunt or penetrating injuries of the trachea.

In tracheal reconstruction using flaps or grafts various autogenous free grafts and pedicled flaps have been used to reconstruct partial tracheal defects such as free periosteal grafts, tibial periosteal grafts, autogenous jejunal segment, fresh autogenous untreated circularly positioned cartilage-perichondrium strips, nasal septum composite grafts, hyoid bone graft, pericardial patch, palatal mucoperiosteal graft,

esophageal interposition, platysma musculocutaneous flaps, and rotary door flap.

Some other cases of tracheal lesions are reconstructed with the use of tracheal prosthesis. The ideal prosthesis should be inert and airtight, rigid enough that it does not collapse and should not erode into the surrounding structures. Examples of prosthesis include : polytetrafluoroehtlylene (PTEE), molded silicon prosthesis, silicon rubber T tube and expandable stainless steel stents.

Carinal reconstruction is principally indicated to remove a primary tumor in the airway. The modes of reconstruction of the carina are :

- Approximation of the medial walls of the left and right main branch to one another to fashion a new carina.
- End-to-end plus end-to-side tracheobronchial anastomosis.
- Carinal resection with resection of lobe or lung according to the case.

Considering tracheo-esophageal fistula, it is fairly uncommon but often disastrous lesion that has appeared with the increasing frequency of ventilatory assistance with cuffed tubes and it has to be corrected surgically.

There are many congenital anomalies that may compress the trachea and presented by symptoms of tracheal obstruction which may simulate tracheal lesions e.g., pulmonary artery sling which necessitated surgical correction.

Tracheostomy was also indicated for cases with upper airway obstruction or in the management of secretion in patients with neurologic and acute pulmonary disease. It may carry some complications as

tracheoinnominate fistula or serious cardiac arrhythmias. Mediastinal emphysema and pneumothorax were more common complication in children.

Resection and reconstruction of the trachea and carina showed various complications that appeared with the progress in tracheal surgery. These complications include : complications due to incomplete diagnosis, failure of technique and general complications.

So we concluded that, tracheal reconstruction can be safe and effective method of treatment when we avoid the following pitfalls.

(1) Patients should no longer require mechanical ventilation at the time of resection.

(2) Many patients will be on steroid for presumed " asthma ". All patients should be weaned from steroids prior to resection.

(3) Previous high-dose radiation may preclude safe resection.

(4) Quadriplegics with tracheal stenosis should be carefully assessed before tracheal resection is undertaken.

(5) Children with tracheal stenosis must be carefully assessed. The pediatric trachea is much smaller in diameter and is more susceptible to tension injury than the adult trachea. Postponing reconstruction until the child grows may be the best alternative.

(6) If a recent operation on the trachea has been performed or if marked inflammation of the trachea is present, surgery should be postponed at least 6 to 8 weeks to allow fibrosis and inflammation to subside. A silastic T tube in place of a tracheostomy tube is helpful in these situations.

(7) Tracheostomy is rarely necessary following resection. If one is necessary, a small tube should be used and placed at least two rings below the anastomosis. It should be separated from the anastomosis by local tissue such as the thyroid or strap muscles. A tracheostomy should never be brought out through the repair.

(8) Muscle flaps should always be interposed between esophageal and tracheal suture lines to avoid subsequent tracheoesophageal fistula.

(9) Careful evaluation of glottic competence is mandatory before resection of tracheal stenosis.