



## SURGICAL MANAGEMENT OF ZENKERS DIVERTICULUM AND ITS COMPLICATION

### THILAK SANTHARAM S

Department of ENT, KILPAUK MEDICAL COLLEGE AND HOSPITAL

#### Abstract :

50 year old female patient on evaluation for dysphagia was diagnosed to have pharyngeal pouch for which excision of pouch by external approach was performed. Later patient developed pharyngo-cutaneous fistula, which was managed conservatively.

#### Keyword :

Pharyngeal pouch, Pharyngo-cutaneous fistula, Cricopharyngeal myotomy

#### Introduction:-

Pharyngeal pouch (Zenker's diverticulum) is a rare disorder characterised by formation of a pulsion diverticulum due to failure of relaxation or incoordination between the pharyngeal stripping peristaltic wave and the cricopharyngeal sphincter. It has a rare incidence of 0.4 :1,00,000 population and is common in males above the age of 40. Various treatment options available are endoscopic approaches of removing the party wall and external approaches to excise the sac. Asymptomatic patients whose pouch are incidentally detected are not treated.

#### Case Report:-

50 year old female patient presented to the ENT department with complaints of dysphagia 2 years duration. Insidious onset and progressive in nature .H/O regurgitation of foul smelling indigested food particles when patient assumes a supine position was present. The patient was subjected to all basic investigations including barium swallow which showed pharyngeal pouch in the left side. Videolaryngoendoscopy examination showed pooling of saliva in both pyriform fossae. Oesophagogastrosocopy showed a wide mouthed pouch in the Left posterolateral aspect of cricopharynx and a party wall separating this with the main esophageal lumen .Since the pouch was wide mouthed It was excised by a lateral cervical approach and cricopharyngeal myotomy done. During the post operative period on the 7th POD, patient developed Pharyngocutaneous fistula the same was managed conservatively. Patient improved of symptoms and is on regular follow up.

#### Radiological investigations:-



Barium swallow - Barium filled pouch with its neck in relation to C6 Vertebrae present in left side.



#### Esophagogastrosocopy

Wide mouthed pouch posteriorly of 4-5cms, Party wall formed by cricopharyngeus muscle between esophagus anteriorly and pouch posteriorly

**Diagnosis:-** Pharyngeal Diverticulum/Zenker's Diverticulum

**Plan:-** Excision of pouch –external approach-lateral cervical

**The following were the salient steps in surgery:**

- Incision made along the anterior border of sternomastoid from cricoid cartilage to suprasternal notch
- Middle thyroid vein ligated
- Trachea and thyroid gland retracted medially and esophagus separated from the pre vertebral fascia along the avascular plane
- Pouch was found in close relation to recurrent laryngeal nerve

- Recurrent laryngeal nerve carefully separated from pouch and preserved
- Pouch excised and pharyngeal defect closed using 3-0 Vicryl
- Extramucosal cricopharyngeal myotomy done
- Wound closed and drain kept

#### POST- OPERATIVE PERIOD

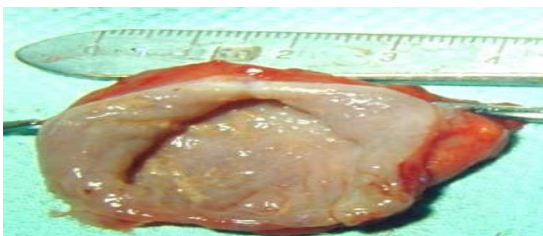
- Patient was kept nil per oral for 48 hours
- started on ryles tube feed from 3rd post operative day
- started on oral feed from 7th post operative day
- Ryles tube removed



Recurrent Laryngeal Nerve and Pouch



Cricopharyngeal myotomy



#### Excised Pouch

Within few hours of commencement of oral fluids patient developed progressive difficulty in breathing, swelling of the neck with crepitus, tenderness over the wound site and patient became febrile. Patient went for respiratory arrest and immediately intubated and connected to mechanical ventilator. A diagnosis of surgical emphysema made out and immediately sutures removed and surgical gastroenterologist opinion sought and wound explored and deep fascia opened and about 50 ml of secretions with food particles let out. Diagnosis of suture dehiscence with PHARYNGO-CUTANEOUS FISTULA made out.



Pharyngo-Cutaneous Fistula

- The patient was put on higher IV antibiotics
- Wound care given by periodic dressing
- Ryles tube reinserted
- Secretions sent for culture and sensitivity

Patient responded well and gradually weaned from ventilator support but was put on ryles tube feeding for the next two weeks until the secretions gradually decreased from the pharyngo-cutaneous fistula and later spontaneous healing of fistulous tract occurred by antibiotics and dressings and patient was started on semisolid diet and later by normal diet. There was no complaints of dysphagia or cough. Ryles tube removed and patient was discharged.



#### Closed Fistula

Picture showing closed fistulous tract with granulation tissue and no secretions

#### DISCUSSION-ZENKERS DIVERTICULUM

##### Definition:-

Pharyngeal pouch is a pulsion diverticulum developing due to incoordination in contractions of thyropharyngeus (oblique part) and cricopharyngeus (horizontal part) of the inferior constrictor. The alternative nomenclatures are pharyngo-esophageal pouch or retro or posterior pharyngeal pouch.

##### Incidence and sex predilection:-

0.4:1,00,000 population, Common in males in age group of 29 to 50 years. it was first described by Ludler and later by Zenker and Vam Zeinseen Etiology:- The various theories proposed are Negus theory-Tonic spasm of Cricopharyngeus, Dohlman and Mattson theory-Lack of inhibitory stimuli to cricopharyngeus, second swallow theory which states lack of coordination between pharyngeal stripping wave and sphincter during second swallow and Korkis theory emphasising neuromuscular incoordination. The histopathology would show, Stratified squamous epithelium of Non Keratinising type, Submucosal Fibrous tissue surrounded by scanty muscle fibre layer

##### LAHEY CLASSIFICATION

##### OGD BASED:-

- Stage 1 small mucosal protrusion
- Stage 2 definite sac but esophagus and hypopharynx in line
- Stage 3 Large sac with hypopharynx in line with neck of sac and esophagus pushed anteriorly.

##### CLINICAL:-

- Stage 1 sensation of food stick
- Stage 2 regurgitation and gurgling
- Stage 3 severe dysphagia

##### Indications for ESOPHAGOSCOPY

- 1.To assess neck of sac- Line of management differs
- 2.To pass Nasogastric tube- easy intraoperative identification of Esophagus
- 3.To pack pouch with gauze pre operatively
- 4.To exclude Carcinoma

##### Treatment Modalities

No treatment if asymptomatic and pouch size <2 cms

##### Treatment Modalities

- 1.Botulinium toxins
- 2.Bougies-risk of perforation, recurrence, stenosis more chance

3. Endoscopic methods

4. Excision by external approach

#### Endoscopic Methods

(Diverticulotomy & Internal myotomy)

Diverticulotomy is converting the pouch and the esophageal lumen into a single cavity by cutting or coagulating through the party wall which is nothing but the cricopharyngeal sphincter- internal myotomy. The indications are medium sized pouch of 2-4 cms and those at high risk for GA. The methods are electrocoagulation, Laser Argon plasma/CO2 photocoagulation and stapling techniques. The recent trend is Flexible esophagoscope With Soft diverticuloscope using 1.8 mm diameter needle knife, hook knife. The main advantage is it is done under Local anaesthesia, lesser time for weaning and suitable for aged persons with other comorbid conditions. The limitations/contraindications for these methods are very small or very large pouches, kyphosis, recurrence, if malignancy suspected. The hazards encountered are thermal injury to recurrent laryngeal nerve and perforation especially in stapling techniques. The diverticulosopes used are of Dohlmann and Weerda types.

#### Dohlmann Diverticuloscope:-

Consists of Anterior beak which is inserted into Esophagus Posterior beak which is inserted into the pouch And the slit which rests on the party wall The diathermy is applied through this slit cutting and coagulating the party wall converting the pouch and the esophageal lumen into a single cavity



#### Dohlmann Diverticuloscope

External approach (lateral cervical approach)- the various methods are inversion of sac or diverticulopexy(tethering the sac to pre vertebral fascia superiorly), Diverticulectomy with stapling or closing with extramucosal cricopharyngeal myotomy, and pouches with mediastinal extension managed by esophagodiverticulostomy where the fundus of sac anastomosed with thoracic esophagus. The indications are large mouthed pouches, if malignancy suspected and failed endoscopic approaches.

#### COMPLICATIONS

**Immediate:-** Haemorrhage, Pneumothorax, Surgical Emphysema, Recurrent Laryngeal Nerve Palsy

**Early:-** Secondary Haemorrhage, Hoarseness, Wound Infection, Pharyngo cutaneous Fistula, Mediastinitis

**Late:-** Persistent Hoarseness, Stricture and recurrence

#### PHARYNGO-CUTANEOUS FISTULA

**Fistulous communication between PHARYNGEAL DEFECT and SKIN Occurs following-**

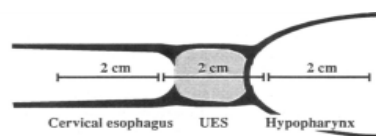
Laryngeal surgeries-Total laryngectomy- 3 to 65 %, Partial laryngectomy, Total pharyngo laryngectomy, 2. COMMANDO surgery, 3. Pharyngeal diverticulum excision. The reasons are dehiscence of suture line or flap necrosis or residual cancer. The signs are persistent low grade fever, erythema, induration, tenderness around wound site, saliva in wound site or in drain and development of surgical emphysema. INVESTIGATIONS to be done are esophagogram, methylene blue swallow test and amylase estimation or detection Principles of management:- are AVOIDANCE OF RISK FACTORS- or special care of them if present. The risk factors are old age, Diabetes, immunodeficiency, H/O previous irradiation, when closure not strengthened by muscle flaps. CARE OF FISTULA-early detection and wound care. CLOSURE OF FISTULA either spontaneous or surgical. Need for early intervention:- are to prevent sepsis or to

prevent adjacent vessel rupture due to enzymatic activity of amylase MANAGEMENT methods are either conservative or surgical.

**CONSERVATIVE-**Successful spontaneous closure may be achieved if salivary accumulation and local/systemic sepsis prevented, if vascularity of flap, Hb% maintained, if it's a unirradiated field and patient doesn't have any chronic systemic medical illnesses. The conservative method of closure is by repeated suctioning and placement of drain tube. nasogastric tube feeding, IV antibiotics to prevent sepsis. Small fistulas heal spontaneously by 2 or 3 weeks **SURGICAL-** surgery is timed when sepsis has been controlled, wound matured and there is improvement of local flap. The indications are failed conservative methods and if the defect is large. The methods of reconstruction are direct two layer closure of mucosa and the skin, split skin graft or flap closure methods using local or distant free flaps. The local pedicled flaps used are Pectoralis Major myocutaneous flap, Deltopectoral flap, Sternocleidomastoid flap and free flaps such as radial forearm or free jejunal flap

#### Conclusion:-

The indication of external approach of excision of pharyngeal pouch is a wide mouthed pouch and size greater than 4 cms. Following excision of the pouch the pharyngeal mucosal defect closure requires adequate support by either local rotation myocutaneous flaps or by free flaps to prevent complications which we encountered in this patient like pharyngocutaneous fistula though adequate cricopharyngeal myotomy has been done. Muscles contributing to Pharyngo-Esophageal Pressure are divided as proximal 2 cms contributed by thyropharyngeus, middle 2 cms contributed by Cricopharyngeus muscle and distal 2 cms contributed by proximal circular muscle fibres of cervical esophagus. So adequate myotomy should extend 2 cms proximal and distal to cricopharyngeal sphincter proper for a total length of 6 cms. The reasons for dehiscence are inadequate myotomy or absence of reinforcement of the pharyngeal mucosal defect by either suturing the longitudinal muscle layer in a double breasting fashion or by muscle flaps, though adequate myotomy has been performed. This strengthening is critical because the pharyngeal stripping wave which travels in a longitudinal fashion alone contributes to a luminal pressure of 100 mmHg which alone is sufficient in giving way of the suture.



#### Components Of Pharyngo-Esophageal Sphincter

#### References

1. Scott-Brown's Otorhinolaryngology, Head and Neck surgery 7th Edition, Michael Gleeson
2. American society for gastrointestinal endoscopy-[www.eurekalert.org/public\\_releases/2013-04asfget043013.php](http://www.eurekalert.org/public_releases/2013-04asfget043013.php)
3. [www.ncbi.nlm.nih.gov/pmc/articles/PMC/2978412/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC/2978412/)
4. [en.wikipedia.org/wiki/Zenker's\\_diverticulum](http://en.wikipedia.org/wiki/Zenker's_diverticulum)
5. [www.ncbi.nlm.nih.gov/pmc/articles/PMC2912732/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2912732/)
6. <http://emedicine.medscape.com/article/836858-overview>
7. Rob and Smith Book of nose and throat surgery

