A Novel Approach in the Management of an Aspirated Voice Prosthesis in a Laryngectomized Patient

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Tracheoesophageal puncture (TEP) and voice prosthesis insertion is presently the preferred method of choice for voice rehabilitation following total laryngectomy in the management of advanced laryngeal cancers.[1, 2] This procedure involves the creation of a fistula between the trachea and esophagus, wherein a one way speaking valve containing silicon voice prosthesis is positioned. The patient is then trained to use and maintain the voice prosthesis by following a protocol for speech rehabilitation under the supervision of a speech therapist.

This procedure is generally considered safe although occasional early and late complications are known to occur. The early complications are usually related to technique of insertion and include bleeding, edema, infection and salivary leakage around the prosthesis. The late complications include salivary leakage, fungal infection (usually *Candida*), granuloma formation around the prosthesis and rarely dislocation/aspiration of the prosthesis.

A 55-year-old adult presented to our emergency services complaining of intractable cough resulting from the aspiration of the food contents through the TEP fistula site. Six months prior, he had undergone a total laryngectomy and primary voice prosthesis (Provox1) insertion for carcinoma larynx. (Stage pT4aN1M0) He was intermittently using a non-cuffed portex tracheostomy tube through his narrowed permanent tracheostoma following adjuvant radiotherapy.

On admission, the patient was haemodynamically stable, clinical examination on removal of the tracheostomy tube showed the absence of the voice prosthesis in the TEP site; interestingly the patient was unaware of the missing prosthesis until then. He had the habit of self-insertion of the

tracheostomy tube and we presume that the prosthesis aspiration might have occurred during this maneuver. Auscultation of the chest revealed decreased breath sounds on the right lung base.

A chest skiagram revealed a vague opacity in the region of the right main bronchus, a CT scan of the chest done subsequently confirmed the presence of the aspirated voice prosthesis in the right bronchus intermedius. A bronchoscopy revealed the voice prosthesis to be occluding the opening of the right middle and lower lobe bronchus (Fig. 1a and b) The voice prosthesis was removed using a laparoscopic biopsy forceps after visualizing it with a parallelly placed 30 degree rigid telescope through the tracheostoma under topical anesthesia. (Fig. 2a and b) A nasogastric tube was placed in the TEP site to facilitate enteral feeds and the patient was discharged the following day with a plan to insert secondary voice prosthesis.

Prosthesis aspiration is a rare complication and to the best of our knowledge only about ten cases have been reported in the Medline literature.[1–5] This is usually believed to happen when patients self attempt to replace the prosthesis or following violent bouts of cough. The clinical presentation of prosthesis aspiration can be varied: some patient's present with life threatening choking while others have minimal symptoms or at times asymptomatic [3, 4].

In most cases, the diagnosis is evident on history, although at times tracheostomized patients may not recollect the event of aspiration. [3] The prosthesis is visualized as a ring shaped opacity on a chest skiagram. A computed tomography of the chest with virtual bronchoscopy may be helpful in ascertaining the exact position of the aspirated prosthesis. [4] The common site of lodgment of the aspirated prosthesis is the right main bronchus,[2] although cases of impaction in the left main bronchus have been reported.

Prosthesis aspiration like any other foreign-body aspiration should be considered as a serious medical emergency

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Fig. 1 **a**, A bronchoscopy revealed the voice prosthesis to be occluding the opening of the right middle and lower lobe bronchus. **b**, CT scan of the chest showing the presence of the aspirated voice prosthesis in the right bronchus intermedius

Fig. 2 **a** and **b**: The instruments used for removal of the voice prosthesis: a Laparoscopic biopsy forceps and a 30 degree rigid telescope

demanding timely recognition and prompt action. A flexible bronchoscopy plays an important role in the definitive diagnosis and this can be therapeutic,[2] while in some cases the rigid bronchoscopy or its modification, as was done in our patient is necessary. A periodic review of the maintenance techniques of voice prosthesis and tracheostomal care can possibly eliminate such unusual complications.

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