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Unusual complication of surgical voice restoration

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Abstract
A case of oesophageal obstruction following the removal of a tracheoesophageal valve by division is presented. The obstruction was caused by impaction of a portion of the valve at a previously undiscovered benign oesophageal stricture. The obstruction was resolved by interventional radiology with no long-term sequelae. To the best of our knowledge this complication has not been described previously.

Key words: Surgical Procedures, Operative; Oesophageal Stricture; Complications

Introduction

Surgical voice restoration (SVR) is now well established in the UK as the favoured method of communication after laryngectomy.[1] The two main types of tracheoesophageal prosthesis being used are the Provox® 2 and the Blom Singer®.

In some patients the 'party wall' between the oesophagus and the trachea may become quite thin (<10 mm) or lose its elasticity. This can lead to the development of uncontrolled leakage around the valve. One current dilemma in SVR is the technique of changing the prosthesis in these patients with a compromised party wall. The normal technique for removing the valve is to grasp the anterior flange and pull it out anteriorly. The concern is that removing a prosthesis in this fashion from patients with a compromised party wall may irreversibly stretch the tissue around the tracheoesophageal fistula (TOF). This increases the chances of leakage around the valve.

One possible method of avoiding this is to remove the prosthesis by cutting off the tracheal flange with a stitch cutter, thus dividing the prosthesis in two. The tracheal half is then extracted through the tracheostomy and the oesophageal half removed by pushing it through the fistula into the oesophagus.

We present a case where this procedure was carried out and resulted in partial obstruction of the oesophagus.

Case report

In June 1999 a 74-year-old male was diagnosed with a $T_4N_0M_0$ piriform fossa squamous cell carcinoma. The same month a total laryngopharyngectomy, right selective neck dissection, free radial forearm flap, cricopharyngeal myotomy and primary tracheoesophageal puncture were performed.

Two weeks later a 10 mm Provox® 2 valve was inserted. After four months the party wall had thinned down and the valve was downsized to a 8 mm Provox® 2. Nine months later this was downsized further to a 6 mm Provox® 2. The patient was coping well with this valve and was managing a normal diet with no difficulty. Eleven months later his valve was found to be leaking and was replaced with one of the same size using the division technique, as described above. The patient achieved a good tracheoesophageal voice at a conversational level. Two weeks later the patient's daughter contacted the department and reported that the patient was having difficulty swallowing, and in particular was experiencing marked reflux after drinking. Videofluoroscopy showed the prosthesis lodged above a stricture in the lower oesophagus (Figure 1).

After some discussion it was felt that endoscopic removal would be unlikely to succeed due to a stricture around the site of the original pharyngeal anastomosis.

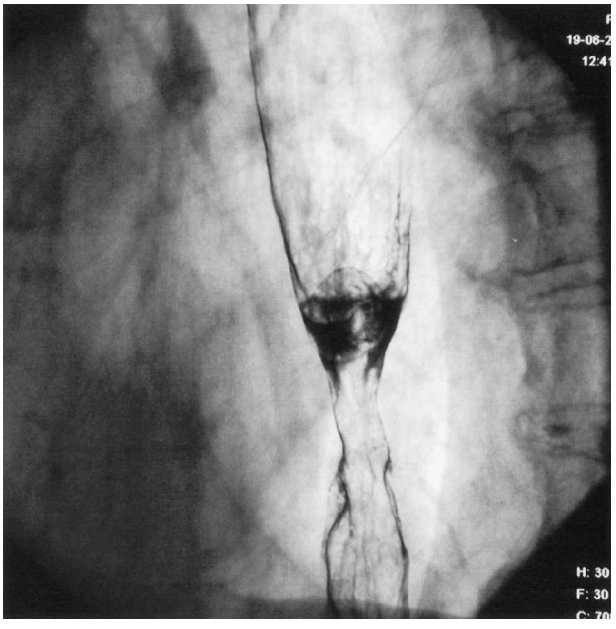

Fig. 1
Contrast swallow showing outline of valve just proximal to stricture.

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The supervising radiologist therefore dilated the stricture with a 19 Ch Lunterquist-Owman oesophageal balloon dilatation catheter and pushed the valve through into the stomach. This successfully solved the problem and one year later the patient is still swallowing well.

Discussion

The term 'compromised party wall' refers to a specific group of patients with some or all of the following criteria:

(1) a tracheoesophageal wall under 10 mm wide;
(2) no ongoing medical/malignant disease in the tissue around the TOF;
(3) the TOF is, or is in danger of, leaking around the valve;
(4) the party wall is mobile and appears to have lost its natural elasticity;
(5) the patient has often received a full course of radiotherapy;
(6) the patient is often cachectic.

These patients can therefore have a thin, inelastic party wall into which the valve does not bed. This predisposes them to a leak around the valve. Every subsequent valve change tends to stretch the party wall beyond its elastic limit and cause further, permanent enlargement of the TOF. This increases the chance of a leak around the valve still further.

In inexperienced hands the first response to a leaking TOF is often to change the valve for a different size. This can lead to frequent valve changes in an attempt to halt the leak, whilst actually achieving just the reverse.

The correct management of these patients involves an entire package of care; including downsizing the valve diameter, use of prophylactics to prevent candida and by dividing the valve to prevent trauma to the stoma. (personal communication; Y Edels, Macmillan National SVR Lead, Charing Cross Hospital). One of the first points is to change their valves as infrequently as possible. The best way to achieve this is to treat their valve as an indwelling valve and make every effort to clean it *in situ* rather than to change it. Where a valve change becomes unavoidable, then a good technique is to divide the valve rather than pulling it through the wall. This case does however highlight the need for a degree of vigilance after this type of valve change. This is particularly required with the Provox® 2 valve (23F 7.7 mm), as this is somewhat larger than the biggest Blom-Singer® (20F, 6.7 mm) and thus more likely to become lodged in an oesophageal stricture. It is also worth noting that the introducer for the Provox® 2 reaches a maximum of 34F (11.3 mm) as opposed to 22F (7.3 mm) for the 20F Blom-Singer®.[2] This probably makes the Provox® 2 system more likely to cause problems in patients with a compromised party wall.

- **The management of patients requiring surgical voice restoration presents many challenges**
- **One challenge is how to prevent patients with a narrow party wall from developing a grossly dilated tracheoesophageal fistula during valve changes, with the associated increased risk of leakage around the valve**
- **This may be achieved by dividing the valve, but care must be taken that the swallowed valve fragment does not cause obstruction at the site of any pre-existing oesophageal stenosis**

References

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