The pharyngeal pouch: clinical aspects and management

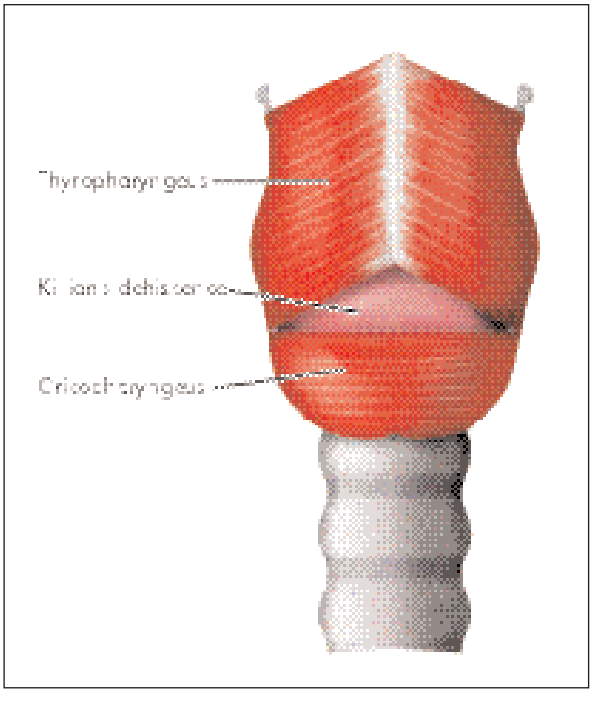
This article covers the management of patients who have a pharyngeal pouch. The condition of pharyngeal pouch is defined, together with discussion of the incidence, diagnosis, aetiology, pathology and treatment. These patients are often elderly and sometimes frail, so the newer minimally invasive endoscopic surgical techniques are especially important. The outcomes, complications and recurrence rate of endoscopic pouch surgery are discussed.

A pharyngeal pouch is a herniation of pharyngeal mucosa through a defect in the posterior pharyngeal wall. The terms Zenker's diverticulum and hypopharyngeal diverticulum are also used.

The location of the herniation is the posterior wall of the pharynx through an area of natural weakness between the two parts of the inferior constrictor muscle. This area was described by Killian in 1908 and is referred to as Killian's dehiscence (Killian, 1908) (*Figure 1*).

The exact reason why some patients develop a pouch remains uncertain, although a mechanism incorporating incoordination between the descending peristaltic wave and the cricopharyngeus muscle is the most widely held theory (*Figure 2*). The incoordination creates an abnormally high intraluminal pressure which leads to mucosal herniation through Killian's dehiscence. Gastric reflux frequently contributes to the cricopharyngeal muscle incoordination.

Figure 1. Killian's dehiscence; an area of weakness in the posterior pharyngeal wall between thyropharyngeus and cricopharyngeus.



Incidence

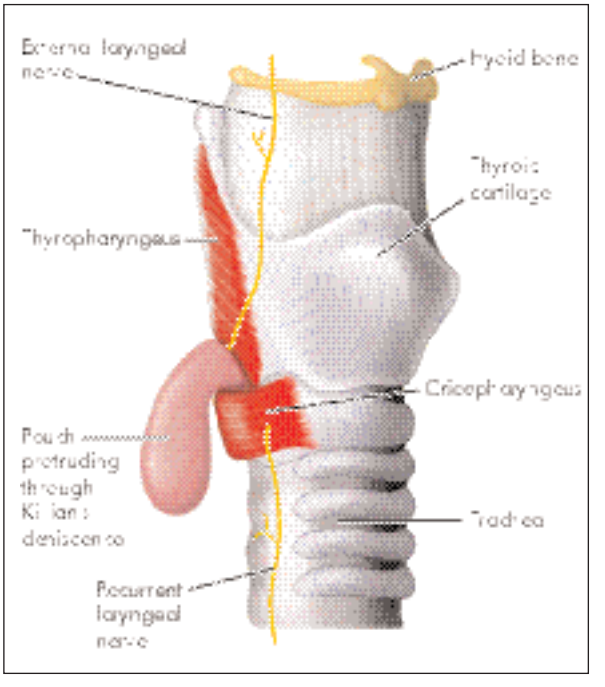
It is difficult to quantify the exact incidence of pharyngeal pouch in the general population because not all patients present to their doctor. From the ear, nose and throat (ENT) specialist's point of view the incidence is 1 case per 100 000 per annum in the UK.

Pharyngeal pouch is more common in men with a ratio of approximately 2:1. Patients are usually over the age of 50 years (*Figure 3*), with the most common presentation between the sixth and ninth decade. The condition of pharyngeal pouch affects Caucasians and is extremely rare in Asian and Afro-Caribbean races.

Symptoms and diagnosis

Patients present with symptoms of variable severity, not necessarily related to the size of the pouch. The majority

Figure 2. Lateral view of pharynx and larynx showing a pouch protruding through Killian's dehiscence.



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of patients present with longstanding symptoms. Indeed it is the insidious onset and slow progression of the symptoms that causes most patients to present with a well-developed pouch and sometimes severe weight loss.

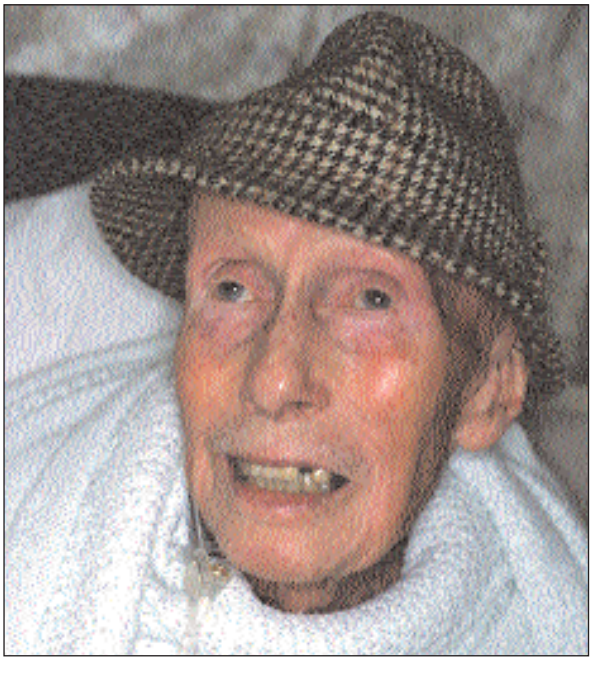
Dysphagia is the most common symptom and is present in all patients. Dysphagia needs to be distinguished from the 'sensation of a lump in the throat' which typifies globus syndrome. In a patient with a pharyngeal pouch, the early symptoms are of solids sticking in the throat with the need to swallow several times to clear the food. Frequently the patient makes an attempt to chew every mouthful of food down to small fragments. As the condition progresses it becomes impossible to enjoy a meal out with friends, because of the excessive length of time it takes to eat the meal and because regurgitation sometimes occurs during eating. If the pouch is not treated, eventually it may lead to total dysphagia which is accompanied by severe weight loss and malnutrition.

Regurgitation of undigested food occurs in 80% of patients with a pouch. Frequently there is stasis of food in the pouch: this leads to a foul taste and friends or relatives may complain about the patient's halitosis.

Pulmonary complications frequently occur as a result of aspiration of the pouch contents into the larynx. The aspiration may lead to chest infections, pneumonitis, lung abscess, bronchiectasis and lung collapse. Hoarseness occurs because of laryngitis caused either by aspiration or gastric reflux which commonly co-exists.

The patient may complain of a lump in the neck that appears intermittently and gurgling noises in the neck are sometimes noticed. The patient is often aware that food is sticking in the upper throat and frequently will point to the region just below the cricoid cartilage.

Figure 3. Pouch patients are often elderly and frail and may present with marked weight loss.



Clinical examination may reveal a thin or malnourished patient. The endoscopic view of the larynx and pharynx may be normal although pooling of saliva may sometimes be seen.

The differential diagnosis includes all motility disorders of the pharynx and oesophagus (globus, scleroderma, achalasia) as well as structural oesophageal disease (neoplasm and strictures) and finally neuropathies and myopathies. Gastro-oesophageal reflux disease (GORD) is often present and virtually all motility disorders have been reported in association with GORD. The successful treatment of GORD usually improves the symptomatology of all motility disorders and this applies to patients with a pharyngeal pouch.

The investigation needed to confirm the diagnosis of a pharyngeal pouch is either a barium swallow or a video-contrast swallow. The latter gives considerably more information about the function of the pharyngeal muscles as well as the presence or absence of gastric reflux (Richardson and Bastian, 1998). It is essential that the contrast study includes the lower oesophagus and stomach because a lower oesophageal carcinoma can co-exist with a pharyngeal pouch.

Pathology

The histology of an excised pouch shows an epithelial lining of stratified squamous epithelium and submucosa, often with fibrous tissue and a few muscle fibres surrounding it.

Carcinoma occurring within a pouch is extremely rare and was first described by Vinson (1927). There are only 30 cases reported in the English literature. Huang et al (1984), in a series of 1249 patients, found only four patients with a malignancy arising within the pouch, which is an incidence of 0.32%.

Carcinoma usually occurs in individuals who have had a pouch for a long time. The average duration of symptoms in the four patients that Huang et al described was greater than 7 years. The main predisposing factor in developing a carcinoma is thought to be chronic irritation and inflammation of the pouch lining from food retention. The symptoms indicating a carcinoma are rapidly increasing dysphagia, pain and/or blood in the regurgitated food. Nodes or a mass in the neck may be found. Pharyngeal pouch patients do not normally complain of pain or bleeding and the dysphagia usually progresses slowly. An urgent endoscopy is required in any individual with these suspicious symptoms, whether or not they have had a pouch treated before. It is important to remember that a carcinoma can occur in a remnant of a pouch after it has been excised and, after endoscopic treatment, a carcinoma can still occur because the wall of the pouch remains in place. Vigilance is therefore required, especially in anyone who has rapidly progressing dysphagia or pain.

Management options

The management options for patients with a pharyngeal pouch can be divided into three groups: conservative, external approach surgery and endoscopic surgery. Particularly for patients with a pharyngeal pouch it is essential to carefully consider the overall health of the patient as well as assessing how much effect the pouch is having on the individual's quality of life.

When weighing up the decision as to whether or not to operate, it is important to consider that the symptoms associated with a pharyngeal pouch usually increase with time, whereas the elderly patient's overall health tends to decline. In Zenker's original review, 13 out of 22 patients died because of the complications associated with living with a pharyngeal pouch (Zenker and Van Zienssen, 1878).

However, a very small pouch may cause minimal symptoms in which case it may be appropriate for the patient to live with their symptoms. Fifteen years ago it was quite common for patients to be turned down for surgery on the grounds that they were not fit enough to survive. The majority of the surgery at that time was done using an external approach and this was a major operation which was associated with significant morbidity and mortality. In 2005 patients are now offered minimally invasive endoscopic surgery which is combined with general anaesthetic techniques that hardly seem to disturb the patient at all. If the patient is 'fit enough for a haircut' then they are likely to survive modern anaesthesia and pouch surgery.

The history of pouch surgery is interesting, with Ludlow of Bristol being the first, in 1769, to identify a patient with a pharyngeal pouch. In 1878 the clinical features were described by Zenker. In 1886 Wheeler reported the first successful excision of a pharyngeal pouch, performed on a sergeant major who also had a lateral pharyngocoele from over-exercising his voice on the parade ground.

The principle of endoscopic treatment, in which the cricopharyngeal bar is divided to create a common cavity so that the food bolus must pass into the oesophagus, was first described by Mosher in 1917. This method was popularized by Dohlman in the 1940s who divided the bar with diathermy in 39 patients without any complications (Dohlman and Mattsson, 1960). Until 1990 surgeons were equally divided between those who used an external approach and those who used endoscopic diathermy. Collard was the first person to use a cutting stapler device to divide the common wall between the pouch and the oesophagus (Collard et al, 1993). The advantage of the stapler device is that, once the cricopharyngeal bar is cut, the edges of the wound are sealed with 200 or so tiny titanium staples. This prevents any leakage into the mediastinum. Newbegin and Baldwin further developed this technique in the UK (Martin-Hirsch and Newbegin, 1993; Baldwin and Toma, 1998). Van Overbeek in the Netherlands used an endoscopy technique with a laser to divide the cricopharyngeal bar, with good results in over 500 patients (Van Overbeek, 1994).

In 1996 in the UK there was a National Confidential Enquiry into Perioperative Deaths (NCEPOD) following pouch surgery and it recommended that endoscopic stapling techniques should become the treatment of choice for all pouch surgery (Resouly, 1996). It further recommended that there should be one or, at the most, two surgeons within each ear, nose and throat department who should perform all pouch surgery. Following the NCEPOD recommendation there has been a shift away from pouch excision and most pharyngeal pouch surgery in the UK is now done endoscopically using either a stapling device or carbon dioxide laser (Siddiq and Sood, 2004).

Since 1993 the author has used the endoscopic technique in over 250 consecutive patients with pharyngeal pouch.

Informed consent is extremely important. A patient information leaflet, as well as a video, is a useful way of giving the patient comprehensive knowledge of what the procedure entails.

- The possibility of not being able to safely complete the operation should be discussed. The biggest problem is prominent teeth (usually with expensive crown work) (*Figure 4*) and this may be combined with retrognathia. Patients with difficult anatomy should be told that it may not be possible to safely staple the pouch and an alternative strategy should be discussed before surgery.
- Patients should be told that there is a risk of damaging their teeth even though a protective gum guard is used.
- There is a small risk of perforating either the pouch or oesophagus during any endoscopic procedure (1 in 250 in the author's experience). Should a small perforation occur, then it may be sutured endoscopically or managed conservatively, but if a large perforation occurs it is prudent to open the neck and repair the defect. It follows that any surgeon undertaking pouch surgery should be competent in head and neck surgery.

Figure 4. An expensive set of crowns like this makes life difficult.

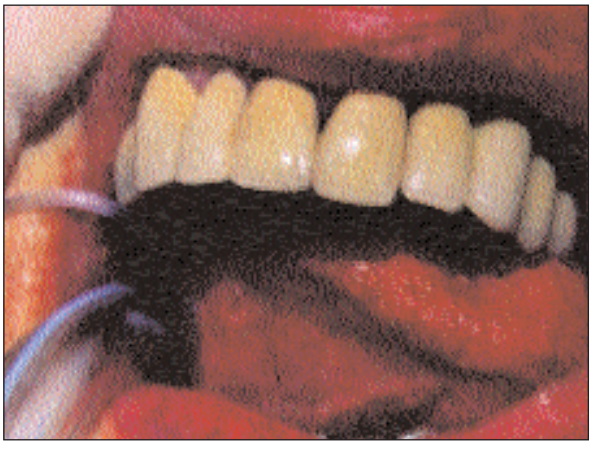


Figure 5. Suspension apparatus is connected to a special pharyngoscope through which the surgeon can see the oesophagus and the pouch.

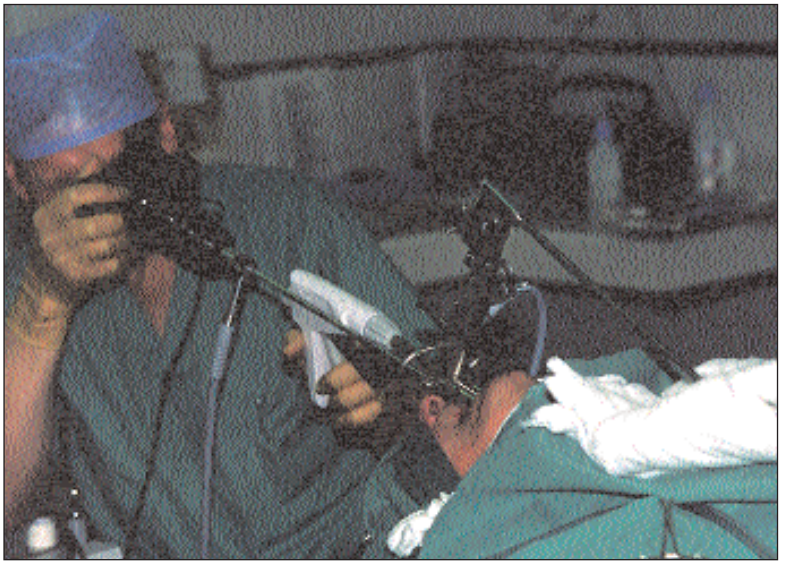


Figure 6. View through the pharyngoscope showing the oesophagus, cricopharyngeal bar and pouch.

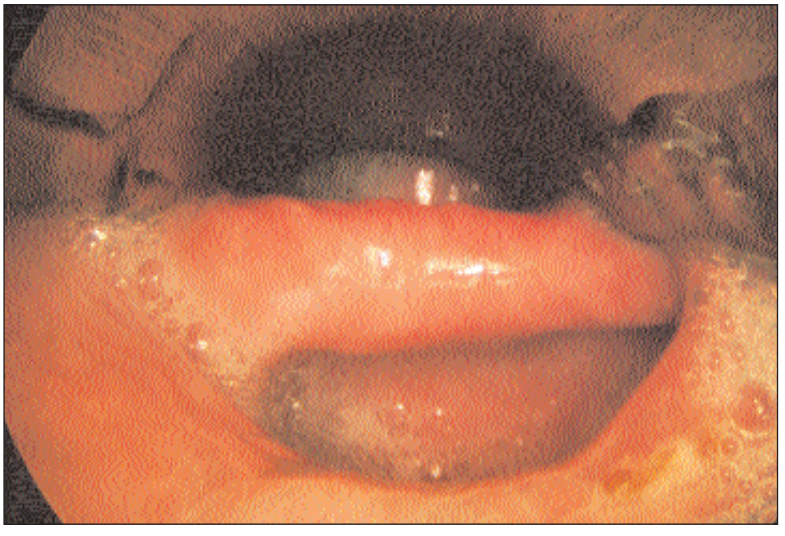
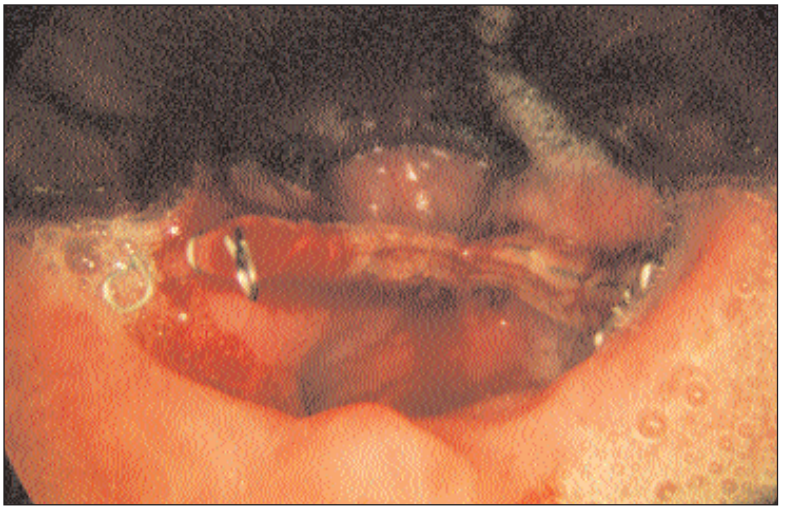


Figure 7. The cricopharyngeal bar has been cut by the stapling device and the edges sealed with a triple row of titanium staples.



- Very small but symptomatic pouches are difficult to treat and if the video swallow identifies a very small pouch the patient should be told that it may not be possible to deal with it either with a stapling technique or laser technique. If the symptoms are bad enough the possibility of doing a cricopharyngeal myotomy via an external approach should be discussed with the patient.

In terms of results from the author's own figures there is an 85% chance of significantly improving all the patient's symptoms. It is important to explain that, once the patient has formed a pouch, no matter what treatment is applied, the swallowing may never return completely to normal because of the underlying muscle incoordination. However, in most patients the majority of the dysphagia and regurgitation disappears. There is a recurrence rate of approximately 15% and the recurrence can occur from 3 months to 10 years post-surgery. If the patient's symptoms do recur then a repeat barium swallow or video swallow is unhelpful because the pouch wall will still be present and it looks like a pouch whether the patient is asymptomatic or not. It is therefore best to judge the clinical situation by assessing the patient's symptoms. If the symptoms are extremely troublesome it is usually worth doing another endoscopy because further stapling can usually be undertaken with minimal disruption to the patient's life.

Figure 5 shows the patient on the operating table in the supine position. A suspended endoscope is used to provide a view of the oesophageal opening and the pouch with the cricopharyngeal bar in the middle (*Figure 6*). It is usually necessary to gently clear food debris from the pouch using a soft tip sucker and the pouch can be washed out with saline. A Hopkins telescope is used to inspect the lining of the pouch and any abnormality should be biopsied.

Once a satisfactory view of the cricopharyngeal bar is obtained an Endopath EZ35B (Ethicon Endo-Surgery, Cincinnati, USA) linear cutting stapling gun or similar device is inserted into the oesophagus, with the anvil (lower jaw) going into the pouch. With the cricopharyngeal bar lying between the two jaws of the gum the jaws are closed and locked in place. The gun is fired and this divides the bar and simultaneously seals each of the cut edges with a triple staggered row of titanium staples (*Figure 7*). The release button is then fired to free the jaws and the gun is gently removed, making sure that the jaws are not snagged on any tissue.

If a patient has had a previous pouch excision or an endoscopic procedure, there is usually no problem re-operating and interestingly the appearances are very similar to a new presentation.

Postoperative care

The patient should not eat or drink for the first few hours after the operation which gives the surgeon time

to check the patient's general wellbeing and in particular to confirm the absence of neck or back pain, a tachycardia, or surgical emphysema. Any of these symptoms indicate a possible perforation of the upper oesophagus. A nasogastric tube is not routinely required but should be inserted if significant mucosal damage occurred during the operation. Antibiotics are not routinely required and should be reserved for complications. A sensible approach is to allow the patient to drink water initially and then proceed to a soft diet on the evening of surgery if all is well. The majority of patients can be discharged on the first postoperative day and can eat normally. It seems logical to treat patients with symptomatic gastric reflux with protein pump inhibitors although as yet there is no evidence to suggest that this practice reduces the risk of recurrence of the pouch.

Outcomes

Endoscopic procedures are now at least as effective as pouch excision and are associated with a much lower complication rate.

Endoscopic procedures involving division of the cricopharyngeal bar produce good results, particularly when the larger series under the care of one surgeon are considered. Van Overbeek (1994) is the most experienced pouch surgeon in the world and has a recorded success of 91% with a revision rate of 8% and a very small number of major complications.

Conclusions

Long-term results are now available for endoscopic pouch procedures and they show that these operations are superior to the external operations. Cricopharyngeal myotomy as a sole procedure has a role in the treatment of the very small pouch, but there are now few indications for pouch excision. Endoscopic stapling or laser division are quick and bloodless, are associated with minimal discomfort and avoid the need for a nasogastric tube. Endoscopic techniques permit an early oral intake and early hospital discharge, thus reducing the morbidity and costs traditionally associated with pharyngeal pouch surgery.

The experience of the surgeon appears to be of utmost importance. There is no place for the occasional operator. At times pouch surgery can be difficult and the complications life-threatening. Surgeons who have developed an interest in pouch surgery sufficient to publish large series demonstrate good results. **BJHM**

Conflict of interest: none.

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KEY POINTS

- Pharyngeal pouch occurs in elderly, sometimes frail, patients.
- The incidence is 1 per 100 000 per annum in the UK.
- Diagnosis is made with barium or video swallow.
- Surgery improves quality of life.
- Endoscopic resection with stapling device or laser treatment is the treatment of choice.
- Recurrence is easily treated with endoscopic techniques.
- Carcinoma in a pouch is rare but vigilance is required.
- Surgeons with a special interest in pouch surgery should treat all patients.