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# A third decade's experience with the gastric pull-up operation for hypopharyngeal carcinoma: changing patterns of use

B. E. J. HARTLEY, B.Sc., F.R.C.S., I. D. BOTTRILL, F.R.C.S., D. J. HOWARD, F.R.C.S., F.R.C.S., (ED.)

**Abstract**

Gastric transposition has been used extensively in this department since 1965 for reconstruction following pharyngolaryngoesophagectomy (PLO). A previous report by Harrison and Thompson in 1986 detailed our experience with 101 cases dating back to 1965. Here we review our experience between 1986–1996.

Medical records of 41 cases were examined. The primary site and stage of tumour and associated lymph nodes, patient demographics, complications, in-patient mortality and survival as demonstrated by the Kaplan-Meier method were recorded.

Gastric transposition is now used for more extensive tumours: 70 per cent T4 (83 per cent pathologically T4) compared to 21 per cent in the previous report. A high proportion of 'radiation failures' remains (54 per cent). The in-hospital mortality has fallen from 11 per cent to seven per cent. The five-year-survival calculated using the Kaplan-Meier method is 11 per cent.

This procedure is increasingly being used as a palliative procedure aiming to restore swallowing in the relatively young patient who has very extensive hypopharyngeal carcinoma. Long-term survival rates specific to this operation have fallen. This is attributed to patient selection for the procedure with the vast majority having disease extending into bone, cartilage or soft tissues (T4). The defect created by the resection of less extensive tumours are now increasingly reconstructed with jejunal free flaps and musculocutaneous flaps.

**Key words: Hypopharyngeal neoplasms; Stomach; Survival rate, complications**

## Introduction

A detailed database of all head and neck surgery has been collected in this department since 1961. This is a follow-up study to that of Harrison in 1986 who looked specifically at those patients who had undergone pharyngolaryngoesophagectomy with gastric transposition (Harrison and Thompson, 1986). Here we analyse the data collected and discuss changing trends in the use of this procedure.

The use of the stomach as a method of reconstruction was first described by Turner in 1936. The technique that we use is in essence that described by Ong and Lee in 1960 modified so that thoracotomy is not carried out and the oesophagus is mobilized through an enlarged oesophageal hiatus as popularized by Harrison (Harrison, 1979). Colon has been used as an alternative but stomach has the advantage of an excellent blood supply and a single anastomosis whereas colonic interposition involves three anastomoses and has a higher potential for anastomosis-related complications.

## Materials and methods

The records of all patients undergoing PLO with gastric transposition were analysed for the period 1986–1996. This yielded a total of 41 patients. The following data were collected for analysis: age, sex, site of primary lesion, TNM stage clinically at the time of operation and also pathologically, duration of hospital stay, complications, survival, details of pre- or post-operative radiotherapy. Thirty seven of the 41 patients were followed up until death or present time. Only four patients were lost to follow up.

## Results

The age range was 31–80 years with an average age of 56.4 years. The male to female ratio was 20:21. Twenty-three patients (56 per cent) had had previous radiotherapy as a primary curative measure and had recurrent disease. These were classified as radiotherapy failures. The range of hospital stay was from eight to 63 days with an average stay of 20 days. Three patients died before discharge from hospital (seven per cent) two from bronchopneumonia and

From the Royal National Throat Nose and Ear Hospital, Grays Inn Road, London, UK.
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TABLE I
POST-OPERATIVE COMPLICATIONS

| Complication | |
|---|---|
| Haemorrhage | 1 |
| Fistula | 1 |
| Pneumonia | 4 |
| Stomal obstruction | 2 |
| Pneumothorax | 2 |
| Myocardial infarction | 1 |
| Iliac vein thrombosis | 1 |

one from haemorrhage. The post-operative complications are listed in Table I. The commonest primary tumour sites were the postcricoid region and hypopharyngeal recurrence of primary laryngeal carcinoma (Table II). The distribution of clinical and pathological T stage and N stage is described in Tables III and IV. Figure 1 shows the Kaplan-Meier survival curve.

## Discussion

When carcinoma of the hypopharynx is extensive the prognosis is poor. If the disease involves the cervical oesophagus the five-year survival is less than 25 per cent regardless of therapy. The majority of patients with advanced disease die within 18 months of diagnosis (Sasaki *et al.*, 1995). The main aim of management in these patients is to improve quality of life.

Unoperated patients often face an existence with increasing dysphagia, pain, airway obstruction and recurrent aspiration. Gastrostomy can provide a route for feeding but as dysphagia progresses patients become unable to swallow their own saliva. Tracheostomy alleviates airway obstruction but often tumour grows into the tracheostomy site with further airway obstruction. Distant metastases are rare and patients usually die from local disease or regional spread to the cervical nodes.

It is therefore not uncommon to be asked to perform extensive surgery for palliation. Surgery is aimed to improve quality of life. Ideally this involves a procedure with low morbidity and mortality, good swallowing results with a rapid return to oral feeding and if possible voice restoration with tracheo-oesophageal fistula or oesophageal speech. It is our experience that the gastric transposition is increasingly being used to provide this palliation in those patients with extensive tumours who are otherwise regarded as fit enough to survive this major procedure.

In this institution three principal methods are regularly used for reconstruction of the pharyngeal segment following excision for hypopharyngeal cancer. These are gastric transposition, free jejunal flap repair and myocutaneous flap repair. The indications for each form of reconstruction are separate.

TABLE II
PRIMARY TUMOUR SITE

| Primary tumour site | |
|---|---|
| Larynx | 12 (29.2%) |
| Pyriform fossa | 6 (14.6%) |
| Post-cricoid | 12 (29.2%) |
| Post-pharyngeal wall | 10 (24.3%) |
| Cervical oesophagus | 1 (2.4%) |

TABLE III
CLINICAL AND PATHOLOGICAL T STAGE

| T stage | Clinical | Pathological |
|---|---|---|
| T1 | 1 (2.4%) | 0 |
| T2 | 8 (19.5%) | 4 (9.7%) |
| T3 | 3 (7.3%) | 3 (7.3%) |
| T4 | 29 (70.3%) | 34 (82.9%) |

Gastric transposition gives excellent clearance at the lower tumour margin as total oesophagectomy is performed. The stomach has an excellent blood supply so that local necrosis and fistula are extremely uncommon. A more major operation is required with significant in-hospital mortality; seven per cent in this study but as high as 25 per cent in others (Stell *et al.*, 1983). Therefore this method is generally preferred for more extensive hypopharyngeal tumours extending into the cervical oesophagus.

For the smaller and more superior tumours, particularly in the pyriform fossa, the free jejunal flap is used. This avoids a major abdominothoracic procedure and the operative mortality is corresponding lower (Jones *et al.*, 1996). The incidence of graft failure and fistula are however significant and post-operative stricture is not uncommon (Ho *et al.*, 1993). It is our experience that the swallowing results obtained with gastric transposition are superior. Harrison reported that all patients in his series achieved successful swallowing before they left hospital – usually within two weeks of surgery (Harrison and Thompson, 1986).

Myocutaneous flaps can be used in tube form for circumferential defects but fistula and stenosis rates are significant (Schuller, 1983). Our practice is to use these much more commonly in partial pharyngectomy as a patch-type repair. Pectoralis major, lattissimus dorsi and free radial forearm flaps are all used for this.

Previously gastric transposition was commonly used for small and large tumours. Harrison's distribution was T1 three per cent, T2 49 per cent, T3 29 per cent and T4 21 per cent. Other series also have a relatively small proportion of T4 lesions including Ho *et al.* 1993 (14 per cent). The survival is correspondingly higher as might be expected with more limited disease. We have noticed a marked

TABLE IV
CLINICAL AND PATHOLOGICAL N STAGE

| N stage | Clinical | Pathological |
|---|---|---|
| N0 | 27 (65.8%) | 9 (22.0%) |
| N1 | 0 | 3 (7.3%) |
| N2a | 2 (4.9%) | 3 (7.3%) |
| N2b | 4 (9.8%) | 7 (17.0%) |
| N2c | 1 (2.4%) | 3 (7.3%) |
| N3 | 1 (2.4%) | 1 (2.4%) |
| Nx | 6 (14.6%) | 15 (36.6%) |

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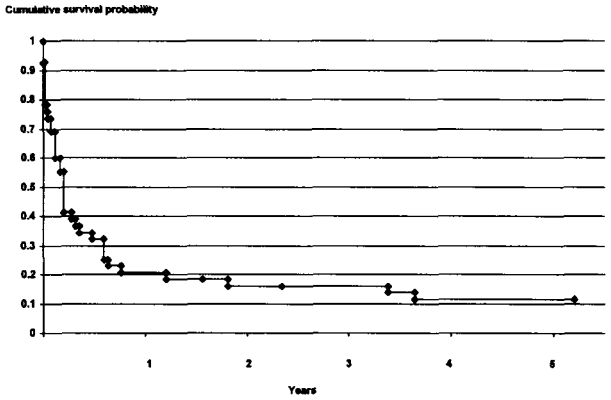


FIG. 1
Kaplan-Meier survival curve.

shift in this series with the proportion of T4 lesions rising to 70 per cent when classified clinically and 83 per cent when classified pathologically.

The TNM staging system is for clinical staging. When tumours are assessed pathologically, however, a different picture may be found. In this series the pathological examination of the tumour resulted in an increased T and N stage in many cases. The pathological staging is important when retrospectively comparing treatment and survival as it gives the most accurate assessment of the extent of the disease. In pre-operative decision-making only the clinical stage will be available and it is important that the clinician is aware of the potential inaccuracy involved. Based on our experience this often means that hypopharyngeal carcinoma is more extensive than suspected.

We have also noticed a change in the surgical pathology of the tumours that are being selected for gastric transposition. Previously the predominant tumour site was the postcricoid region (67 per cent in Harrison's series). Although post-cricoid tumours are still one of the commonest there is a marked increase in the proportion of hypopharyngeal recurrence of laryngeal tumours, from four per cent to 29 per cent. Hypopharyngeal recurrence of primary laryngeal tumours predominate some series (Yuen *et al.*, 1996) and in others there is a high incidence of tumours of the cervical oesophagus (Spiro *et al*, 1983; Sasaki *et al.*, 1995). It should be remembered, however, that with extensive disease it is often difficult to determine the exact subsite of origin.

The survival curves portray the poor life expectancy for this group of patients. This is to be expected in a highly selected group whose disease was extensive and whose primary aim of surgical treatment was often palliation. The Kaplan-Meier method of calculating survival is preferred now to crude and adjusted survival curves (Stell and Morton, 1982). For this series of patients the one-year survival specific to this operation is 21 per cent and the five-year survival, 11 per cent.

The complications are mainly related to the thorax (Table I). These have been reduced by the routine use of bilateral chest drains. Three patients died before discharge from hospital. In two cases the cause of death was bronchopneumonia and in one, massive haemorrhage from a major intrathoracic vessel. Two patients had problems with stomal obstruction due to dried secretions. One of these resulted in respiratory arrest in a patient with severe bronchopneumonia who later died.

The options are limited for patients with extensive T4 hypopharyngeal carcinoma. The survival is poor regardless of treatment and untreated the symptoms are severe. The gastric transposition can provide palliation for those fit enough to survive a major procedure.

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Address for correspondence:
B. E. J. Hartley,
ENT Dept,
Charing Cross Hospital,
Fulham Palace Road,
London W6 8RF.

Fax: 0181 846 1070