Gastroenterologist versus Surgeon Performed Endoscopic Gastrostomy: A Multi-Centre Comparative Study.

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Citation

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Abstract

PEG tube placement has been widely embraced by endoscopists as a means of accessing the gastrointestinal tract for feeding. In this study we compared the outcomes of PEG tube placement by gastroenterologists and surgeon endoscopists.Materials and MethodsData on PEG outcomes were retrospectively collected over 31 months from the Georgetown Hospital in the Cayman Islands where PEGs were performed exclusively by surgeons. This was compared with data collected over the same period from the University Hospital of the West Indies in Jamaica where PEGs were performed exclusively by gastroenterologists.ResultsThere were 74 PEG tubes placed by gastroenterologists and 35 placed by surgeons. The gastroenterologists had a higher collective case volume than surgeons (37 vs 18 cases per year). There were no significant differences between gastroenterologist and surgeon performed PEG in terms of procedural success (98.6% vs 100%; P=0.84), overall morbidity (6.8% vs 8.8%; P=0.71), early mortality (4.3% vs 0; P=0.549) or late mortality (11.8% Vs 0; P=0.049).ConclusionsAppropriately trained surgeon endoscopists and gastroenterologists can site PEG tubes with similar success and complication rates.

INTRODUCTION

PEG tube placement has been widely embraced by endoscopists as a means to access the gastrointestinal (GI) tract for feeding. The technique is becoming increasingly popular in many Caribbean territories (1-3). At the University Hospital of the West Indies (UHWI) in Jamaica, gastroenterologists have been performing PEG tube placement since 1999 (1). Surgeons have not become involved in this practice largely because endoscopic training is not incorporated into surgical post-graduate programmes at the UHWI. In contrast, most North American and European training centres incorporate endoscopic procedures into their surgical residency programmes (4). In these settings, surgeons perform several diagnostic and therapeutic upper and lower GI endoscopies, including PEG.

We carried out this comparative study of PEG tube placement between the two disciplines to determine the safety of this practice by surgeon endoscopists. Since this practice has not yet become realized at the UHWI, data from the Cayman Islands were used as controls for surgeon-performed PEG.

MATERIALS AND METHODS

Data on PEG tube placement were retrospectively collected over a period of 31 months from January 2005 to August 2007. The hospital records of all patients who had PEG placement during the study periods were retrieved for analysis. Records were collected from the UWHI in Jamaica where PEG placement were performed exclusively by gastroenterologists and from the Georgetown Hospital in the Cayman Islands where PEG tubes were placed exclusively by surgeons. Patients who were transferred from other hospitals for this service were excluded from the final analysis as their records would not be available for review.

The standard “pull technique” was utilized at both centers with one of several commercially available PEG introduction systems: Freka® PEG Set (Fresenius Ltd, Warrington, UK); Ponsky® PEG Kit (Bard Endoscopic Technologies, Massachusetts, USA); Cook® PEG Kit (Wilson-Cook Medical Inc, North Carolina, USA). Prophylactic antibiotics were routinely used at both hospitals. The operative techniques have already been detailed in previous reports (1, 3).

The data collected included case volume, success rates, PEG-specific morbidity, and early mortality. These data were entered in a Microsoft Excel worksheet and analyzed using SPSS version 12.0. The outcomes were assessed by Pearson's Chi-square and Fisher's exact tests. Significance was considered present with a two-tailed P value < 0.05.

RESULTS

There were 35 surgeon-led procedures identified during the study period. There were 15 males and 20 females, with ages ranging from 49 to 92 years (Mean +/-SD: 77+/-14.4). Hospital records were retrieved for all the patients for detailed analysis. The operations were performed by one of three surgeons with endoscopic training who had a collective case volume of 18 PEGs per year.

There were 74 gastroenterologist led procedures during the study period. There were 45 females and 29 males, with ages ranging from 31 to 96 years (Mean +/-SD: 73.8+/-15.2). The operations in this setting were performed by one of two trained gastroenterologists. Collectively, this service had a higher case volume of 37 PEGs per year. Table 1 compares the outcomes between the gastroenterology-led and surgical-led procedures.

Figure 1

Table 1: Comparison of the outcomes of PEG according to operator

Parameter	Surgeon performed PEG	Gastroenterologist performed PEG	P Value
Number of cases analyzed	35	74	<<0.01
Yearly case volume	18	37	-
PEG completed <36 hours after decision	3 (8.8%)	0 (0%)	p = 0.029
PEG completed >36 hours after decision	32 (91.2%)	74 (100%)	p = 0.029
Success rates	35 (100%)	73 (98.6%)	p = 0.84
Mean Operating Time	24 minutes	Unavailable	-
Duration of hospitalization			
• Mean +/- SD	3.15 +/-2.29 days; 95%CI (2.37,3.93)	16.08 +/-19.3 days; 95%CI (8.50,23.66)	p = 0.003
• Median (25%, 75%)	3.00 days (2, 4)	10 days (1.5, 21.5)	p = 0.003 X_D=12.93; 95%CI (4.9,20.9)
PEG specific morbidity	3 (8.8%)	5 (6.8%)	p = 0.705
• Bleeding	1 (2.9%)	0	p = 0.315
• Aspiration	1 (2.9%)	2 (2.7%)	p = 1.000
• Hypoxia	0	0	-
• Perforation	0	0	-
• Penetration	0	0	-
• Fistula	0	0	-
• Dislodgment	1 (2.9%)	2 (2.7%)	p = 1.000
• Wound infection	0	1 (1.4%)	p = 1.000
Early mortality (<48 Hrs post PEG)	0	3 (4.3%)	p = 0.549
Late mortality (>48Hrs post PEG)	0	8 (11.8%)	p = 0.049

Abbreviations: CI = Confidence Interval; SD = Standard Deviation; X_D = Standard Difference of the Mean

There was a significantly greater yearly case volume by the gastroenterologists at the UHWI (74 vs 35; P<0.001). This is because the population in Jamaica served by the UHWI (660,000 persons) is 16.5 times larger than that in the Cayman Islands (40,000 persons) served by the Georgetown Hospital (5). However, when case volume was evaluated according to the population size served by the respective hospitals, the odds ratio of completing PEG was 5.5 times greater for the surgeon endoscopists despite a significantly smaller population served.

DISCUSSION

The utility of PEG tubes has increased dramatically over the three decades it has been in clinical use (6). There are several advantages over the open surgical technique for gastrostomy including reduced morbidity, shorter duration of hospitalization, financial savings and good patient tolerance (6-9). There are also many advantages over nasogastric tube feeding including lower aspiration rates, superior nutritional efficacy and better patient tolerance (10-13). The technique

is becoming popularized in several Caribbean countries (1-3), although still performed at low volumes compared to international standards (4,6,7).

Most endosopic procedures, including PEG, have long been thought to be within the realm of gastroenterologists (14), but many surgeons are now performing endoscopic procedures in North America and Europe (14,15). The American Board of Surgery stipulates that general surgery residents be “familiar with endoscopy” at the completion of their training (4), but there are no comparable requisites at the UHWI surgical residency programmes.

Gastroenterologists perform PEG exclusively at the UHWI, although there are now surgeons trained in endoscopic techniques who are competent in PEG placement. We designed this study in an attempt to increase the acceptance of surgeon-performed PEG. Since this practice has not yet become realized at the UHWI, data from the Cayman Islands were used to evaluate surgeon-performed PEG.

The surgeon endoscopists had lower absolute case volumes but greater odds ratios to perform PEG than that for gastroenterologists, despite the marked difference in population served by their respective hospitals (40,000 vs 660,000 persons). There may be several explanations for this, including differences in access to equipment, availability of operating lists, population age and demographics and indications for PEG. However, the reason cannot be determined from this type of study. We recognize that the small absolute case volumes limit the statistical analysis in this study. A larger sample size with comparable case volumes may have increased the analytic power of this comparison, but this will require continued data collection and analysis.

Expeditious placement has been touted as one advantage of surgeon performed PEG because the procedures can be performed in the operating room simultaneous with other operative procedures (14,20). This observation was also true in our study where the interval between the decision to offer PEG and completion of the procedure was shorter when performed by surgeon endoscopists (8.8% vs 0 completed in 36 hours; $P = 0.029$).

Both disciplines had similar success in PEG (100% vs 98.6%) that is comparable to the outcomes reported from high volume centres (4-6,16-19). The single failure in the gastroenterologist led group occurred in the only patient with an upper GI tumor (oesophageal carcinoma) beyond which the endoscope could not be advanced. Endoscopy in patients with upper GI tumors is technically difficult, and is recognized as a predisposing factor to complications and procedural failure (7,16). There were two similar patients in the surgeon-led group who had successful PEG, one with an oesophageal carcinoma and one with a partially obstructing pharyngeal carcinoma.

The reported overall complication rates after PEG placement vary widely from 4-30% (6,7,16-19), with an estimated 0.5-1% of patients needing operative intervention for a serious complication (7). There was no significant difference in the overall post-procedural morbidity between the groups (8.8% vs 6.8%) and both were comparable to accepted international figures.

Both groups had higher than expected rates of aspiration (2.9% and 2.7%). Aspiration is reported to occur in 0.3-1.0% of PEG placements and is accompanied by up to 57% mortality (6,16,17). This is difficult to interpret due to the small volume of cases analyzed. Nevertheless we can adopt simple measures to reduce the incidence of aspiration, such as the avoidance over-sedation, minimizing gastric insufflation and complete aspiration of gastric contents before PEG placement (6).

There was no statistically significant difference in early or late mortality between the gastroenterologist-led and surgeon-led groups. The early and late mortality in both groups are in keeping with the PEG-related mortality from larger reports (6,7,19). These deaths may reflect the multiple co-morbidities and poor physiologic status of the patients requiring PEG rather than technical competence.

This information supplements existing data proving that surgeons are able to safely and expeditiously place PEG tubes (3,4,14,21-24). These data should bring encouragement for appropriately trained surgeons at the UHWI to perform PEG. Gastroenterologists should not feel threatened by the surgeon endoscopist performing PEG. Instead they should be viewed as being complementary by performing PEG in technically difficult situations (intra-peritoneal adhesions, scarred abdomen; obese patients) or when gastroenterologists are not available.

There are advantages to surgeons becoming adept in PEG placement. Patients under anaesthesia can have simultaneous PEG placement when gastrostomies were not anticipated pre-operatively in ill patients or during emergency operations. This will obviate the need for temporary

nasogastric tubes and prevent the exposure of patients to potential complications of a second procedure for PEG placement. Even when the need for gastrostomy is anticipated, gastroenterologist-performed PEG at the time of operation or as a separate pre-operative procedure may be logistically difficult to arrange, even in tertiary centers.

In order to safely perform PEG, surgeons must be appropriately trained and proficient in endoscopic techniques. This type of training has other benefits to surgeons (4,14,21-24). Intra-operative endsoscopy is indispensable to evaluate oesophageal calibre during fundoplication or Heller's myotomy and to ensure anastomotic integrity during laparoscopic oesophageal and gastric operations. The detection of synchronous lesions intra-operatively is another advantage. One retrospective study of 210 surgeon performed PEGs revealed that 37% of patients had unexpected upper GI lesions at endoscopy, and those findings led to a change in therapy in 90% of the patients (21).

As a training institution we must prepare the surgeons for practice in all regions within the Caribbean where multi-disciplinary input may not always be available. We must also be prepared to teach residents modern practice as surgery continues to evolve. We cannot achieve this without endoscopic training because these skills are crucial in advanced operations such as laparoscopic gastric bypass and in the novel modality of natural orifice transluminal endoscopic surgery (NOTES). Surgeons cannot learn these techniques overnight because it takes dedicated training and experience gathered over time to become proficient endoscopists (4,6). If local surgeons continue to ignore endoscopy, we will never be able to evolve by performing these modern surgical procedures.

CONCLUSIONS

Surgeon endoscopists and gastroenterologists are placing PEG tubes with similar success and complication rates. Institutions should be more open to surgeons performing PEG and policy makers should make the necessary space and equipment available as needed for appropriately trained personnel to maintain their competence.

ACKNOWLEDGMENTS

All work was completed without outside funding.

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