

## **Percutaneous Endoscopic Gastrostomy in Difficult Paediatric Cases**

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### **Abstract**

**Aim :** PEG (Percutaneous Endoscopic Gastrostomy) could be a difficult procedure in neurologically impaired children with associated severe scoliosis and history of previous surgery. The aim of this study was to assess the safety of Laparoscopic Assisted Percutaneous Endoscopic Gastrostomy (LAPEG) in comparison to Laparoscopic Gastrostomy (LG) and simple Percutaneous Endoscopic Gastrostomy (PEG).

**Material and Methods :** A retrospective review of 29 cases performed during three years time was undertaken. Patient demographics, time of operation and complications were assessed. Data collected was compared with other published series.

**Results :** The completion rate of the procedure was 100%. There was no incidence of any bowel perforation. Important complications were wound infection/granulation tissue formation in 10% cases and tube dislodgement in 10% cases. The mean operative time was 20 minutes.

**Conclusion :** Laparoscopic percutaneous endoscopic gastrostomy (LAPEG) is a safe technique in children. It is particularly of value in children with severe scoliosis, previous abdominal surgery and those with previous unsuccessful attempts at PEG insertion.

### **Introduction**

Attempting Percutaneous Endoscopic Gastrostomy (PEG) in neurologically impaired children with associated severe scoliosis and history of previous surgery could be dangerous, because part or whole of the stomach may lie in the left upper quadrant, deep to the costal margin. Other minimal invasive procedures in practice these days are Laparoscopic Gastrostomy (LG) and Laparoscopically Assisted Percutaneous Endoscopic Gastrostomy (LAPEG).<sup>1,2</sup> The aim of this study was to assess the feasibility and safety of LAPEG in children.

### **Material and Methods**

Case notes of 29 children, who underwent

LAPEG were reviewed retrospectively. All children received a general anaesthetic. Peritoneal cavity was approached by a 5 mm infra-umbilical port using open Hasson's technique. Once the stomach was visualized, a gastroscope was passed by the assistant and the stomach was gently insufflated. Care was taken not to insufflate too much air into the stomach as that would result in gastric and small bowel dilatation, making the procedure difficult. A percutaneous needle from the PEG kit was inserted under direct vision into the stomach. A guide wire was then passed through the needle and the gastrostomy tube was railroaded into position. The position of the gastrostomy tube was confirmed by introducing the gastroscope. The infraumbilical wound was closed with absorbable suture material. Feeds were

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started 12 hours post-operatively.

## Results

All LAPEG procedures were completed successfully without any incidence of bowel perforation or peritonitis. The mean time for the procedure was 38 minutes with a range of 25-55 minutes. The time calculated for each procedure includes time from start of the anaesthetic to extubation. The surgical time (from start to finish of the actual surgical procedure) when prospectively evaluated in 10 children was recorded to be 20 minutes. The complications included stoma site infection/granulation tissue formation [n=3(10.3%)] and dislodgement [n=3(10.3%)]. All tubes were repositioned successfully without any incidence of peritonitis. The PEG site infection/granulation tissue resolved with local measures in 2 children, while one required formal surgical excision.

## Discussion

PEG was first described by Gauderer and Ponsky in 1980.<sup>3</sup> After over two decades journey with PEG, we have found that the incidence of minor and major complications still range from 2-90% and 3-19% respectively.<sup>3-7</sup> Several laparoscopic methods of gastrostomy placement have been reported in literature.<sup>1,2,8-12</sup> Some involve laparoscopic visualization of the stomach and doing a PEG procedure under laparoscopic vision. Another method is to exteriorize stomach via a separate wound and extracorporeal placement of stitches to secure the gastrostomy or insertion of the MIC-key button gastrostomy as a single stage procedure.<sup>1,9,10</sup> In thick abdominal walled children, especially teenagers, it needs larger port site and further extension of incision to deliver stomach, a procedure which would be more painful.<sup>2</sup> The incidence of major complications like gastroenteric or a gastrocolocutaneous fistula

was 2-3.5%, which is usually due to an inadvertent enterotomy made during the blind placement of the introducer needle for gastric access.<sup>13,14</sup> Zamakhshary *et al* reported 3.8% incidence of peritonitis in 26 cases of laparoscopic gastrostomy (LG) and 10.8% incidence of transcolonic tube placement with faeculent peristomal discharge in 93 cases of PEG.<sup>1</sup> In a recent series of laparoscopic gastrostomy in children, the incidence of major complication requiring operative intervention was 6.5%.<sup>15</sup> As per our observation, Sherman *et al* in his 15 cases of LAPEG also reported 100% procedure completion rate with 0% incidence of major complications like bowel injury or peritonitis.<sup>2</sup> Lee *et al* quoted a mean operative time of 22 minutes for this procedure; which was similar to that found in 10 of our prospectively timed patients.<sup>9</sup> Sherman *et al* also reported his time range as 20-45 minutes.<sup>2</sup> LAPEG is a simple and safe technique allowing direct visualization of the stomach during insertion of the percutaneous needle, thus making it an easier and simpler technique to perform and teach. Additionally, the gastrostomy site can be properly selected to avoid gastrooesophageal reflux and migration/obstruction of pyloric end by balloon.<sup>16</sup>

It is technically challenging to insert a PEG in children with severe scoliosis or previous history of abdominal surgery, who are particularly at risk of complications or even failure of insertion during conventional PEG insertion. LAPEG is of particular benefit in these children.

## Conclusion

LAPEG requires basic laparoscopic experience and can easily be learnt by trainees. It is a simple and safe technique for gastrostomy in difficult cases. It eliminates most of the major complications associated with the procedure (e.g. gastro-colic fistula,

peritonitis) and in our opinion a gold standard method for difficult gastrostomy!

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#### EFFECT OF PCI ON QUALITY OF LIFE IN PATIENTS WITH STABLE CORONARY DISEASE

In the COURAGE trial, percutaneous coronary intervention (PCI), added to optimal medical therapy, did not reduce the subsequent rate of death or myocardial infarction among patients with chronic coronary disease. A quality-of-life analysis showed that measures of health status improved significantly with either strategy, but patients in the PCI group had greater initial improvements.

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