Endoluminal Silicone-Covered Stenting in Children: Novel Applications and Lessons Learned.

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Background: Silicone-covered stents have been applied to various hollow visceral disorders in adult patients with varying success. Efficacy of retrievable endoluminal stenting in children is less well-established. Benign esophageal strictures from caustic ingestion or esophageal anastomosis are the more common pediatric indications. Given our early success with retrievable endoluminal stenting of the esophagus, we extended this promising technique to other pediatric natural orifice disorders. The purpose of this study was to evaluate our experience with evolving applications of endoluminal silicone-covered stenting in children.

Methods: Children 19 years and younger having silicone-covered stent placement for various indications at a single institution (2014-2021) were reviewed retrospectively. Patient and disease characteristics, procedural and stent details, complications, and resolution of the endoluminal disorder were analyzed.

Results: Eight patients (15 months to 19 years; median: 9.17 years) received a total of 26 silicone-covered stents (Table). Three patients had acute esophageal perforations or leaks, which resolved rapidly with stent placement. Two patients had chronic esophagopleural salivary fistula that benefitted physiology while the stent was in place, but one ultimately required operative closure of the fistula. Three stent placements (11.5%) were associated with a direct adverse event. One patient with esophageal stricture incurred perforation during stent placement while adjusting the stent position without a guidewire in place, requiring thoracotomy to repair. Another child with acute esophageal perforation had prolonged intubation due to partial tracheal compression from the proportionally large stent size. The third patient with a mediastinal granulomatous process that caused esophageal perforation had stent migration shortly after initial stent placement requiring retrieval and larger stent placement. To resolve the endoluminal disorder, four patients required multiple stents or further intervention including serial dilations to maintain patency of the targeted lumen. When evaluating novel applications, one patient having vaginal atresia with hematometrocolpos ultimately developed normal appearing vaginal mucosa and achieved regular menses (Table). Another patient having disruption of an ileal pouch anal anastomosis for ulcerative colitis achieved a healed and patent anastomosis with luminal integrity. Patient-reported symptoms included some minor neck discomfort with a high cervical esophageal stent.

Conclusion: This experience highlights the broad and innovative applications for endoluminal silicone-covered natural orifice stenting in children. Acute esophageal perforations or anastomotic leaks respond well and rapidly to stenting, although chronic, established fistula may require additional manipulations or surgery. When repositioning, it is mandatory to recapture the entire stent in the deployment catheter and adjust over a wire.