Diverticular disease is one of the most common and costly gastrointestinal disorders among Western countries and is increasing in prevalence among westernized nations. In the United States alone, the disease is present in more than 50% of adults by the seventh decade of life and is associated with substantial health care expenditure, estimated at $5.5 billion annually.\(^1\) While the spectrum of diverticular disease is largely nonoperative, including most diagnoses of acute diverticulitis with perforation, the presence of purulent or feculent peritonitis (Hinchey stage III or IV disease) warrants emergent operative intervention. The 2-stage Hartmann procedure (HP) has been the standard of emergent surgical management for the last 50 years but is associated with decreased stoma reversal rates secondary to the morbidity associated with reversal of an end colostomy and colorectal anastomosis. Primary resection with anastomosis and proximal diversion (PAPD) was proposed as an alternative approach beginning in the late 20th century, but this procedure was slow to be adopted widely given lack of equipoise. In light of increasing evidence from retrospective analyses and randomized clinical trials (RCTs) finding equivalent rates of postoperative mortality and major complications with increased rates of stoma reversal after PAPD compared with HP, PAPD was included as a valid treatment option in clinical practice guidelines from the American Society of Colon and Rectal Surgeons (ASCRS) in 2014.\(^2\) Patients are often considered candidates for PAPD if proximal and distal ends of the colon are not inflamed and are amenable to anastomosis, the patient is not in septic shock, and the patient is not immunocompromised.

Although the use of urgent PAPD for Hinchey stage III or IV disease has increased following the aforementioned changes in ASCRS guidelines, overall use remains low, at approximately 8% based on National Surgical Quality Improvement Program 2012 to 2016 data.\(^3\)-\(^4\) Resistance to broader adoption of PAPD has been associated with surgeons’ concerns regarding the generalizability of available RCTs. These concerns are associated with the studies’ limited enrollment and recruitment of patients exclusively from academic or referral centers outside of the United States with no evidence of hemodynamic instability or multisystem organ failure.\(^5\) These narrow inclusion criteria may preclude extrapolation of findings to PAPD performed in the community setting or on an urgent basis. Retrospective reviews of statewide or national clinical and administrative databases have attempted to counter these selection biases by using larger samples that include patients with hemodynamic instability, but these studies have not always produced consistent results.\(^3\)-\(^6\)

Given the relative paucity of large, nationally sourced studies, Sanaiha and colleagues\(^7\) performed a retrospective cohort study using the 2014 to 2017 Nationwide Readmissions Database (NRD) to investigate the association of HP vs PAPD with postoperative outcomes. Their study is among the largest retrospective analyses of urgent surgical management of acute perforated diverticulitis, and the findings are consistent with several established trends. Among patients receiving resection and diversion, HP was more commonly used (94.7% vs 5.3%), although the rate of PAPD use increased during the study period, from 2.6% to 7.1%. Patients who underwent PAPD had a more favorable risk profile, with a younger mean age, fewer baseline comorbidities, and decreased rates of end-organ dysfunction. However, after adjusting for patient and demographic factors, including age, baseline comorbidities, income status, presence of multiorgan dysfunction, hospital safety net status, and annual hospital sigmoidectomy volume, the odds of index admission mortality, postoperative complications, and nonhome discharge were similar between surgical...
approaches. Furthermore, PAPD was associated with an increased rate of stoma reversal and fewer median days to stoma reversal. These findings are consistent with the results of RCTs, which have demonstrated similar rates of morbidity and mortality between PAPD and HP and increased rates of stoma reversal with the former procedure.4,5

The question remains whether the current preponderance of data, from this study and others, is sufficient to define PAPD as the optimal operation and HP as a second best choice for procedures in the management of Hinchey stage III of IV diverticulitis among patients who are nonimmunocompromised and not in shock. A meta-analysis of the aforementioned RCTs2 suggested this conclusion. However, while Sanaia and colleagues7 found similar index outcomes between PAPD and HP, they did not find advantages of PAPD compared with HP during index admission. Furthermore, review of secondary outcomes and sensitivity analyses suggests several limitations to the perceived equipoise between PAPD and HP.2 Despite having a more favorable risk profile, patients who underwent PAPD also experienced more frequent unplanned readmissions in raw and adjusted analyses, commonly for electrolyte abnormalities and acute kidney injury. PAPD was associated with a more costly index admission. Hospital and surgeon experience may also be associated with outcomes after PAPD. Prior analysis of the New York State All Payer Database by Goldstone et al6 found that colorectal board certification was associated with increased use of PAPD and decreased postoperative mortality. While the NRD lacks surgeon-specific data, sensitivity analysis in the study by Sanaia et al6 found decreased mortality and complication rates when PAPD was performed at hospitals with increased volume of emergency general surgical procedures (>50 procedures per year). Finally, while several index outcomes were similar with PAPD and HP in adjusted analyses, there is a significant selection bias associated with which patients are offered PAPD outside of an RCT setting. In this and other retrospective analyses, patients who underwent PAPD consistently had a lower risk profile with fewer baseline comorbidities and decreased frequency of septic shock or markers associated with end-organ dysfunction.4,6 In the study by Sanaia et al,7 patients offered PAPD were also more likely to be privately insured, a marker associated with socioeconomic status.

While the results of this and antecedent studies suggest that PAPD can likely be used more widely, favorable outcomes associated with PAPD may be greatly dependent on judicious preoperative risk assessment, patient selection, and surgeon experience or comfort. Perhaps these data also suggest that primary resection and anastomosis without proximal diversion should be considered among patients for whom HP is not indicated, given the frequency of stomal complications and paucity of anastomotic complications in this population. Risk factors, patients’ goals and values, and intraoperative findings should all be considered when choosing operative procedure. We believe that primary resection and anastomosis should be used with increasing frequency, but we strongly oppose the notion that HP should be considered a procedure of antiquity. HP is likely the ideal choice of operation for some patients. Further investigations are needed to match patients with their ideal operations.

ARTICLE INFORMATION

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