A Prospectively Validated Clinical Risk Score Accurately Predicts Pancreatic Fistula after Pancreatoduodenectomy

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BACKGROUND: Clinically relevant postoperative pancreatic fistulas (CR-POPF) are serious inherent risks of pancreatic resection. Preoperative CR-POPF risk assessment is currently inadequate and rarely disqualifies patients who need resection. The best evaluation of risk occurs intraoperatively, and should guide fistula prevention and response measures thereafter. We sought to develop a risk prediction tool for CR-POPF that features intraoperative assessment and reveals associated clinical and economic significance.

STUDY DESIGN: Based on International Study Group of Pancreatic Fistula classification, recognized risk factors for CR-POPF (small duct, soft pancreas, high-risk pathology, excessive blood loss) were evaluated during pancreaticoduodenectomy. An optimal risk score range model, selected from 3 different constructs, was first derived (n = 233) and then validated prospectively (n = 212). Clinical and economic outcomes were evaluated across 4 ranges of scores (negligible risk, 0 points; low risk, 1 to 2; intermediate risk, 3 to 6; high risk, 7 to 10).

RESULTS: Clinically relevant postoperative pancreatic fistulas occurred in 13% of patients. The incidence was greatest with excessive blood loss. Duct size <5 mm was associated with increased fistula rates that rose with even smaller ducts. These factors, together with soft pancreatic parenchyma and certain disease pathologies, afforded a highly predictive 10-point Fistula Risk Score. Risk scores strongly correlated with fistula development ($p < 0.001$). Notably, patients with scores of 0 points never developed a CR-POPF, while fistulas occurred in all patients with scores of 9 or 10. Other clinical and economic outcomes segregated by risk profile across the 4 risk strata.

CONCLUSIONS: A simple 10-point Fistula Risk Score derived during pancreaticoduodenectomy accurately predicts subsequent CR-POPF. It can be readily learned and broadly deployed. This prediction tool can help surgeons anticipate, identify, and manage this ominous complication from the outset. (J Am Coll Surg 2013;216:1–14. © 2013 by the American College of Surgeons)

Despite advancements in operative technique and improvements in postoperative outcomes, pancreatic fistula is widely considered to be the most common and troublesome complication after pancreatic resection. It represents the factor most often linked with postoperative mortality, certain complications such as delayed gastric emptying, longer hospital stays, readmissions, and increased costs. Furthermore, it frequently delays timely delivery of adjuvant therapies, and reduces overall patient survival.[1-7] Placement of pancreatic duct stents, the use of somatostatin analogs[8] or adhesive sealants, or modifications in reconstruction technique have done little to change the incidence or alter the impact of postoperative pancreatic fistulas (POPF).

The emergence of the International Study Group on Pancreatic Fistula (ISGPF) classification scheme established a universal and practical definition of POPF.[9] This

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