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Algorithmic management of Postoperative Pancreatic Fistula (POPF)

Speaker: Sadaf Ali, SKIMS, Srinagar

Any amount of drain fluid with amylase >3 times ULN is defined as a POPF. Grade A is called Biochemical fistula which is temporary and clinically not relevant while Grade B & C are clinically relevant fistulas requiring change of treatment plan or aggressive diagnostic/therapeutic interventions respectively.
Male gender, high BMI, primary disease and depth of access to pancreas amongst others are some patient factors influencing incidence of POPF. Pancreas related factors of importance are amount of fat, size of MPD, dense acinar cells and broad, thick pancreas. Wherein procedure related factors are amount of blood loss, vascularity of the anastomotic site and surgical technique executed. Amongst these various patient and pancreas related risk factors, majority are non-modifiable whereas modifiable risk factors are procedure related. Nutritional status and supplementation are overall the most important modifiable factors influencing the occurrence of a POPF.
The need of the hour is to accept the reality that pancreatic fistulas would occur making it important to anticipate its occurrence rather than just emphasizing on methods to prevent it as established by the fact that despite all innovative techniques, the incidence still remains around 15%.
While majority of grade A fistulas do not need interventions, grade B and C fistulas require a systematic approach and deviation from fast track protocol for which initial management includes goal directed fluid & electrolyte therapy, broad spectrum antibiotics and nutritional care via enteral route as far as possible. Strict vital monitoring with both quantity & quality of drain fluid should be assessed. CRP, WBC count and DFA are simple markers that can guide further management.
A systemic review by Smits et. al. concluded that early prediction variables included elevated serum and drain amylase (day 1). Identified variables for early diagnosis were: non-serous drain efflux (day 3), positive drain culture (day 3), elevated temperature (any day), elevated C-Reactive Protein (CRP, day 4), elevated white blood cell count (day 4) and peripancreatic collections on computed tomography (CT, day 5–10). (1)
The PORSCH trial gives the algorithm to aid in early detection & minimally invasive step-up management of POPF. (2) The algorithm provides advice on three levels: indication of abdominal computed tomography scan, removal of abdominal drain(s), indication for (invasive) intervention based on systematic evaluation of abdominal CT scan. The algorithmic based step-up approach emphasises on being more vigilant in high risk cases from POD-3 to aid early recognition, management and picking up complications before they become clinically evident.
Adequate drainage with wide bore drain(s) are pivotal. Securing a functioning drain for atleast 3 weeks is recommended. Abrupt reduction in drain output warrants a USG for ruling out collections. One should keep a low threshold for a CECT specially if USG findings don't corelate clinically. Drain cultures are a must. Aiming to make fistula a controlled one, delineating the anatomy, using somatostatin analogues and skin care methods like wound managers and stoma bags are other supportive measures. For persistent fistulas, one should not hesitate in placing extra drains.
Relaparotomy should be considered in cases when a fistula persists despite all conservative measures, massive haemorrhage in the absence of interventional facilities, clear diffuse peritonitis with a blocked drain and multiple collections not amenable to drainage.
Four layer invagination technique, duct to mucosa, avoiding any cut through sutures, adequate mobilization of pancreatic stump and giving an omental wrap are some surgical

techniques that have shown promising outcomes. Avoiding upfront surgery in patients with bilirubin above 15mg/dl and taking bile for cultures in stented patients may help in managing fistula with appropriate antibiotics if push comes to shove.

1. Smits FJ, Molenaar IQ, Besselink MG, Rinkes IH, van Eijck CH, Busch OR, van Santvoort HC. Early recognition of clinically relevant postoperative pancreatic fistula: a systematic review. HPB. 2020 Jan 1;22(1):1-1.
2. Smits FJ, Henry AC, Van Eijck CH, Besselink MG, Busch OR, Arntz M, Bollen TL, Van Delden OM, Van Den Heuvel D, Van Der Leij C, Van Lienden KP. Care after pancreatic resection according to an algorithm for early detection and minimally invasive management of pancreatic fistula versus current practice (PORSCH-trial): design and rationale of a nationwide stepped-wedge cluster-randomized trial. Trials. 2020 Dec;21(1):1-6.

Summary prepared by
Rapporteur

Prekshit Chhaparwal
MGMCH, Jaipur