

PERCUTANEOUS MANAGEMENT OF ACUTE NECROTIZING PANCREATITIS

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ABSTRACT

OBJECTIVES: The study aims to evaluate the efficacy of percutaneous necrosectomy (PN) performed under ultrasound control and of endoscopic necrosectomy through secondary sinus track (ENTSST) using nephroscope and cystoscope. **MATERIAL AND METHOD:** Puncture of fluid collections in the pancreas was performed under ultrasonographic control to 23 patients with acute necrotizing pancreatitis (ANP). ENTSST using nephroscope and cystoscope was performed to 47 patients after open or percutaneous necrosectomy and persistent sepsis (without satellite collection of CT). **RESULTS:** Seventeen patients (74%) treated with percutaneous necrosectomy recovered without open surgery. Two of this group died. The average hospital stay was 42 days. Twenty-three patients required an average of two (range 1-4) ENTSST. **CONCLUSIONS:** Based on our initial results we believe that the percutaneous necrosectomy and ENTSST in well selected patients might be the better choice than open necrosectomy and postoperative lavage. Common solution for these methods has not been reached yet.

Key words: acute necrotizing pancreatitis, percutaneous necrosectomy, endoscopic necrosectomy through secondary sinus track.

INTRODUCTION

Conservative treatment is the usual strategy for initial management of acute necrotizing pancreatitis (ANP). Surgical intervention is indicated in infected (peri-) pancreatic necrosis evidenced by fine needle aspiration biopsy (14,15) (FNAB), or in CT-evidenced air bubbles in the necrotized area (8), or in persistent septic condition despite the maximum therapy in the intensive care unit.

Surgical intervention in patients with infected necrotizing pancreatitis (INP) usually consists in laparotomy and necrosectomy followed by prolonged postoperative lavage (PPOL) (3,4,5). This is a traumatic intervention associated with high morbidity and mortality.

A number of minimally invasive techniques, including ERCP and sphincterectomy; fine needle aspiration biopsy, percutaneous (1,6) or endoscopic drainage (2,13) of (peri-) pancreatic collections, pseudocysts and abscesses (9), as well as selective angiography and catheter-guided embolization of bleeding vessels, have gained a foothold as the diagnostic and therapeutic standard in the treatment of acute necrotizing pancreatitis.

In the absence of large randomized clinical trials, most of these techniques are still applied only to manage patients who are critically ill or are considered unfit for conventional surgery.

MATERIAL AND METHOD

Puncture of fluid collections in the pancreas was performed under ultrasonographic control in 23 patients with ANP (Photo 1).

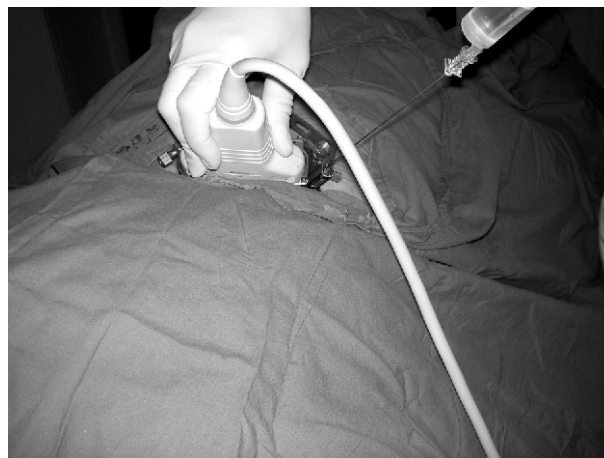


Photo 1

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Percutaneous drainage (PD) under ultrasonographic control was applied only in well ultrasonographically visible collections and a safe path for the puncture needle or catheter. In collections in the pancreatic body, in most cases the needle was guided between the greater curvature of the stomach and colon transversum. In collections in and/or around the pancreatic head, it was guided through ligamentum gastrocolicum, anterior to the duodenum. The stomach was fluid-contrasted for better visualization. In left-sided fluid collections in the anterior pararenal space, either the path between the lower pole of the spleen and the lineal flexure was used, or the needle was retrocolically routed. A guidewire was used, over which the needle tract was then dilated. Plastic dilators with diameters from 12Fr up to 30Fr were used, depending on the consistency of the fluid collection (Photo 2).

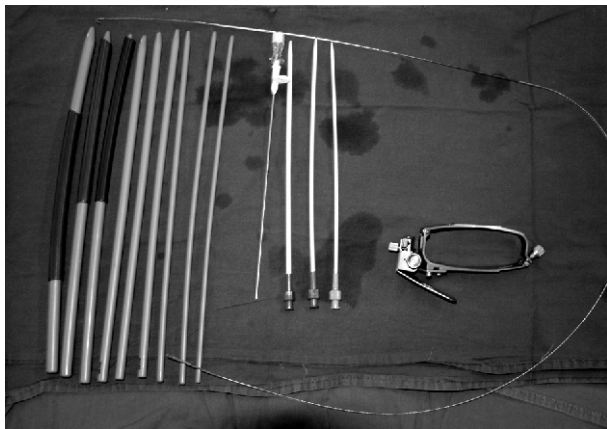


Photo 2

This allowed, in small necroses (>10mm), a 30 Fr Amplatz sheath to be inserted. An operating nephroscope or a cystoscope was inserted through the sheath and then the cavity was irrigated with warm physiological serum (Photo 3).

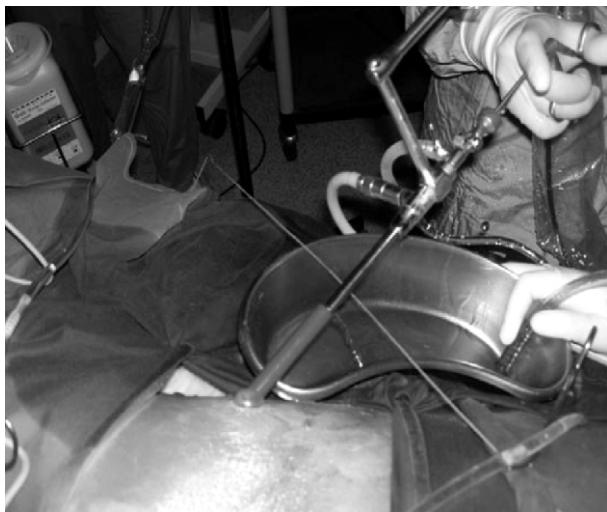


Photo 3

Well organized necroses were evacuated through the working channel of the device using forceps or aspiration. Finally an 8 Fr catheter sutured to a 28 Fr drainage tube was inserted to allow postoperative lavage.

ENTSST (endoscopic necrosectomy through secondary sinus track) using nephroscope and cystoscope was performed to 47 patients after open or percutaneous necrosectomy and persistent sepsis (without satellite collection of CT), applying the same technique.

RESULTS

Percutaneous necrosectomy (PN) was performed to 14 men and 9 women at an average age of 45 years (range 32-74). All 23 patients had evidenced infected pancreatic or peripancreatic necrosis: 11 coliforms, 6 streptococci, 3 Candida, 2 Citrobacter, and 1 Staphylococcus aureus. In 13 patients ANP was caused by cholelithiasis, in 7 - by ethylism, in 2 - by ethylism and cholelithiasis; one patient had secondary inherited hyperlipidemia. In 7 patients the infected (peri-) pancreatic necrosis was evidenced by contrast-enhanced CT. In 16 the infection was confirmed by FNAB under ultrasonographic control. ERCP was performed to 5 of these patients before the intervention.

Initially, ENTSST was performed to 7 patients after open necrosectomy. All of them required intensive care and developed clinical signs of residual sepsis after the first surgical intervention. In all 7 patients, the residual sepsis was resolved without further surgical intervention.

Next, percutaneous drainage was performed to 23 subsequent patients as a main technique for resolution of the (peri-) pancreatic sepsis. Otherwise, these patients would have been managed by open surgery with debridement and lavage. This group included also two impaired patients, who were considered unfit for open procedure.

Two patients in this group died. The first (a 66-year-old man) had ANP with infected fluid collection around the pancreatic tail plus significant comorbidity, including liver dysfunction, steroid-dependent chronic obstructive pulmonary disease, and morbid obesity (BMI-46 \hat{e} â/î 2). He was considered unfit for open laparotomy and percutaneous necrosectomy was performed. The pancreatogenic sepsis was resolved but he died 7 weeks later as a result of combined respiratory and liver dysfunction.

The second patient was a 74-year-old woman with ANP and multiple organ dysfunctions. Eight days after a successful percutaneous necrosectomy, she died as a result of multiple organ dysfunction.

Seventeen (74%) patients treated with percutaneous necrosectomy recovered without open surgical intervention. In all of them the septic condition was resolved within 10 days, except in a 57-year-old man with respiratory and renal dysfunction after multiple surgical interventions resulting in an enteric fistula. Infected residual fluid collection in the pancreatic body was CT-evidenced in this patient. The necrotic material was evacuated using the

percutaneous necrosectomy technique, with subsequent resolution of the multiple organ dysfunctions.

The average hospital stay was 42 days (range 23-213). Twenty-three patients required an average of two (range 1-4) ENTSSST. After these manipulations, only 6 of them (all of whom had evidenced multiple organ dysfunction before the intervention) were managed in the Anaesthesiology and Reanimation Intensive Care Unit (ARICU).

Three further complications were observed. One patient had gastric obstruction continuing for 6 weeks that required prolonged naso-jejunal feeding. After resolution of the septic focus, this condition was successfully managed by gastro-jejunostomy.

Two female patients were re-hospitalized with symptomatic pancreatogenic pseudocyst after the septic focus had been resolved. In both of them communication with the pancreatic duct was evidenced by ERCP and they were successfully managed by endoscopic sphincterotomy and transpapillary drainage. One of the women required percutaneous aspiration of a residual fluid collection.

Adequate evacuation of the necrotic collection was confirmed by contrast-enhanced CT before the drains were removed.

DISCUSSION

Various authors report infection in 8% to 12% of the patients with AP and in over 70% of the patients with ANP. Mortality rates after open necrosectomy range from 15% to 80%. In the past 20 years, the open surgery debridement technique has included: necrosectomy with simple drainage, "second-look" procedures, open laparotomy, necrosectomy with packing or with postoperative lavage (16,17).

The surgical complications rate associated with these procedures has encouraged many authors to use also certain minimally invasive procedures in the evacuation of pancreatic collections (10).

In 1996, TH Baron (2) described the technique combining endoscopic cysto-gastro anastomosis with nasocyst lavage and reported good results in selected patients. At the same time, the author concluded that this method was not suitable for collections containing solid necrotic debris of more than 1 cm evidenced by preoperative CT.

PC Freeny (11) reported complete resolution of the septic focus in 47% of the patients with evidenced infected necrosis after aggressive percutaneous drainage with multiple catheters and lavage. His method requires an average of four drainage insertions and 8-hourly lavage for a mean of 85 days.

The main advantage of percutaneous necrosectomy and ENTSSST over the technique described by Baron and Freeny is the ability for more adequate evacuation of the necrotic material by manipulation, aspiration, guidance of the drain over the inserted guidewire, etc. (7) Baron and Freeny reported that more than 50% of their patients required a second surgical intervention. Baron's technique is

suitable in patients with pancreatic abscesses which do not contain large necrotic material. However, this technique is not suitable in pancreatic necrosis where the solid components predominate.

Another notable feature of PN and ENTSSST is that most patients do not have multiple organ dysfunction in the immediate postoperative period. After open necrosectomy most patients are admitted to ARICU as they require significant respiratory and inotropic support before recovery. Our patients without multiple organ dysfunction before PN and ENTSSST did not develop it as a result of the procedure. 60% of our patients were managed outside the intensive care unit. The need of repeated manipulations will make unlikely a shorter average hospital stay.

Concerning the debates on whether adequate necrosectomy is possible using PN and ENTSSST. Our impression is that the necrosectomy achieved by these methods is similar to that achieved by open surgery. Due to reported hemorrhage when using aggressive PN during the primary necrosectomy, we prefer to remove only well organized necrotic material. The residual necrotic material can be evacuated with ease by the lavage applied or during a later ENTSSST.

Those patients in whom biliary pancreatitis is suspected are referred for ERCP and endoscopic sphincterotomy. The cholecystectomy itself is performed laparoscopically before the patient is discharged.

Approximately 35% of the patients with ANP who develop secondary infection require multiple surgical interventions (16). Each surgical procedure is associated with immediate clinical deterioration before any improvement and lethal outcomes are not uncommon during this deterioration. Complete removal of the necrotic material can be achieved using PN and ENTSSST, furthermore, with much less operational trauma for the patient.

CONCLUSION

The management algorithm for patients with AP associated with significant (peri-pancreatic) necrosis has changed radically in the past 10 years. The common open surgery strategy has evolved into a complex and dynamic multidisciplinary approach. The timing of intervention and flexibility of therapeutic approach are central to it. Multiple organ dysfunctions are recognized as being more significant in terms of outcome than the presence of necrosis or infection. Inadequate drainage of the septic focus is the key to this multiple organ dysfunction, hence, to the lethal outcome in the long run. For a good outcome, it is important to avoid any major surgery intervention in patients with multiple organ dysfunctions and, if possible, to delay intervention until the necroses are well organized, a phase in which morbidity and mortality are minimal.

Based on our initial results we believe that PN and ENTSSST in well selected patients might be the better choice than open necrosectomy and postoperative lavage. Common solution for these methods has not been reached yet.

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