

Severe necrotic and septic pancreatitis. Indications to endoscopic, surgical, and nutritional therapy

G. MANGIANTE¹, L. RODELLA², A. CEROFOLINI², S. GIACOPUZZI¹,
V. PASSERI¹, E. STERZI³, F. CATALANO², G. SCHENAL⁴, G. DE MANZONI¹

SUMMARY: Severe necrotic and septic pancreatitis. Indications to endoscopic, surgical, and nutritional therapy.

G. MANGIANTE, L. RODELLA, A. CEROFOLINI, S. GIACOPUZZI,
V. PASSERI, E. STERZI, F. CATALANO, G. SCHENAL, G. DE MANZONI

Severe acute pancreatitis (SAP) management has changed over the last fifteen years, and from too aggressive behaviour, we moved to a cautious one. In every case, we can appreciate defect of extremist conceptual position.

We reviewed our strategy on disease treatment, and we analyzed treatment of single cases. We collected 4 SAP cases from January 2009 to January 2010. All patients were septic, and we adopted the same approach for all of them, avoiding surgery without peritoneal infection. In all patients we placed jejunostomy and, after cleaning of septic site, we started immediate enteral nutrition (EN). Antibiotic therapy against Gram⁺, Gram⁻ and antifungal drug had been started.

No one died and all patients were back to an active life even if social costs are considerably high especially due to very long hospital stay.

KEY WORDS: Pancreatitis - Endoscopic - Surgical - Nutritional - Therapy.

Introduction

Severe acute pancreatitis (SAP) treatment has changed during the last fifteen years. From too aggressive behaviour, we moved to a too cautious one, on both cases, we can appreciate defects of extremist conceptual positions.

Critical review of our cases allowed to point out single treatments.

Patients and methods

Four case of SAP observed during a year from January 2009 to January 2010, reflect therapeutic behavior adopted.

All patients had an APACHE II score > 10, and each one has been treated by same conceptual approach, that reserves surgical approach to infection of pancreatic necrosis.

1) CG, 54 years old, man, hyperamylasemia 16000 U/l, plenty pain-

ful onset after dinner. Patient has been admitted to another hospital, on the fourth day he has been transferred to our ward. At admission, infection signs of necrosis were present and compelling us to laparotomy and drainage of pancreatic and retroperitoneal sites plus jejunostomy. Antibiotic therapy has been established by Carbapenem and antifungal drugs administration.

Course was favourable but during resolution hyperpyrexia occurred, Computed tomography (CT) was performed and showed pericolic necrotic area. Therefore, we proceeded to percutaneous 12 F tubular drainage, resulting in evacuation of purulent material.

We created a peritoneal cutaneous fistula, and were ready to do a so-called fistuloscopy, through abdominal wall. A bigger drainage has been replaced with 18 F drainage obtaining a hole large enough to perform endoscopy. It was carried out by 5 mm instrument, allowing selective flush out several necrotic debris, and exploration of wide cavities. Full cleaning of cavities has been obtained by four procedures.

2) MN, 37 years old male patient complained epigastric abdominal pain radiating on the back. After previous admittance on another hospital, he was transferred to our ward after three days.

CT scan showed pancreatic oedema, and its necrotic evolution. A central venous catheter (CVC) has been placed and a feeding tube was placed over Treitz ligament by endoscopy to perform enteral nutrition (EN). EN administration (Nutricomp B, Braun, 30 ml/Kg) was associated with inflammatory markers normalization: C-reactive protein (CRP) and procalcitonin (PCT).

CT scan monitoring has been performed every 7 days or in emergency if infection has been suspected; controls showed how the whole area of the gland was replaced by necrosis (Fig. 1). Patient has been discharged on 45th day and scheduled CT control scans every 2 months.

AOUI, University Hospital, Verona, Italy

¹ Surgery of the Esophagus and of the Stomach.

² Service of Endoscopic Surgery

³ Hospital Pharmacy

⁴ Institute of Radiology

© Copyright 2013, CIC Edizioni Internazionali, Roma



Fig. 1 - CT scan shows a wide necrotic area substituting whole pancreatic gland.

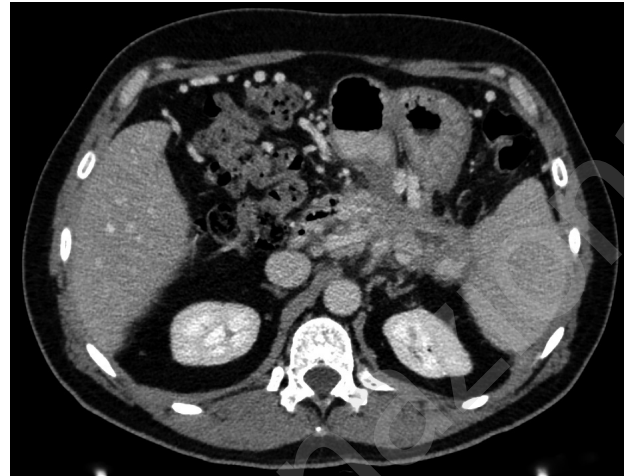


Fig. 2 - CT scan performed after 6 months and after endoscopic drainage of main pancreatic duct.

Control CT scan showed progressive reduction on size of huge necrotic area (Fig. 2).

3) BV, 30 years old male, 2 previous huge alcohol ingestion, and consequent acute pancreatitis with clouded sensorium. A new wide ingestion of spirit with emergency admission due to abdominal pain and dosage of lipases and amylase very high. Esofagogastroduodenoscopy (EGDS) performed on emergency showed duodenal loop edematous, extremely and diffuse mucosal inflammation and allowed positioning enteral nutritional tube over Treitz.

CT scan showed how diffused edema has replaced whole pancreatic gland and infiltrated in retroperitoneal space.

Clinically, we observed decrease of diuresis and increase of intra-abdominal pressure (IAP), reaching on following days up to 25 H₂O cm. Anyway, hemodynamic conditions were normal, with small support of vasotensive amines, and fever persisted, whilst PCT was at normal level, CRP increased up to 345 U/L.

In this scenario CT scan performed did not show pancreatic infection signs, and further PCT maintained between 0.4 to 0.8 U/L, whilst CRP reached 400 U/L.

Due to fever persistence, we are compelled to do percutaneous drainage of pancreatic site. On days after, IAP increase forced of us to perform laparotomy, and placement of vacuum assisted aspiration system (VAC). VAC has been conducted by negative pressure up to 60 mmHg, and replaced every two days (Fig. 3).

4) BG, 84 years old, male, after SAP diagnosis and EN starting, generalized signs of sepsis, and diffuse air bubbles on pancreatic areas showed by CT scan, indicated laparotomy.

We performed pancreatic area drainage, gallbladder removal, jejunostomy positioning to perform EN, retroperitoneal drainage and wide necrosectomy of mature hematic tissue.

On following days, fever was rising again and CT scan showed retrogastric and right retrocolic collections, afterwards drained percutaneously by ultrasonic support.

Also in this case cleaning has been obtained by support of fistuloscopy performed after expansion of abdominal drainage hole (Fig. 4).

EN has been maintained more than other 2 months. After 6 months from discharge general clinical status is good, and BMI was back to 26 score.



Fig. 3 - Severe necrotic and septic pancreatitis. During laparotomy we placed VAC therapy (Smith & Nephew, UK), and jejunostomy 10 F (Sherwood, Tullamore, I).

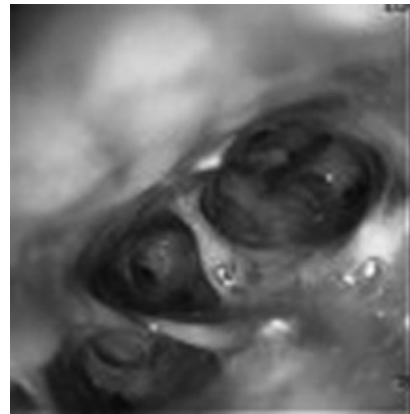


Fig. 4 - Endoscopic landscape as "fox holes". Sseveral septic debris hanged to wall.

Discussion

From these few cases, we cannot identify a general way of treatment for so severe syndrome from point of view of survival and pathophysiology, anyway a few indications can be reached.

1) In these cases early control of shock is mandatory. Administration of fluid is important and should be generous up to 6 liters in 24 hours to preserve not only renal function, but also to avoid occurrence of pancreatic necrosis, preserving microcirculation of the gland. On this case, target of imbibition becomes the lung.

2) EN extends on antibacterial therapy, now international guidelines emphasize the importance of early EN.

Discussion is still open about where infusing mixture, and which kind of new products use as nutrition, such as fish oil, glutamine or arginin. First jejunal loop, 30 cm from Treitz ligament, seems to be the place of choice to locate nutritional tube to reduce the possible residual pancreatic secretion.

Severe cephalic pancreatitis, causes duodenal compression by glandular oedema with consequent reduction of gastric emptying and increased risk of bronchial aspiration especially in older and unconscious patients.

Nowadays, polymeric diet is generally accepted, and few people use on this field elementary or semielementary diet. Recently, there is great interest on omega-three fatty acid use to obtain reduction of exaggerated inflammatory response especially during first weeks of disease.

3) Main problem of SAP is infection of necrotic tissue sterile at his onset. Hypothesis of necrotic tissue infection related to intestinal bacterial translocation justifies use of EN to protect intestinal barrier.

Diets based on omega-3 fatty acid determine potentially lower immune response compared to diet based on other lipids, with production of less active cytokines. Omega-3 therefore are useful on early stages because shift inflammatory response at lower level, avoiding active and powerful components production.

As a matter of fact, immune response is always present, but it is "modulated", that means a reduction at lower level of response with production of leukotriens-3 instead of 4, and same for interleukine 4 instead of 3. Fibers should be always administered as colonic mucosa protection, as they have minimal effect on onset of diarrhea usually determined by antibiotic therapies.

Calories amount must be administered on basis of indirect calorimetry to patients with respiratory failure and so we supply no more than 30 Kcal/h/day.

Usually, we start with parenteral and enteral nutrition, increasing gradually enteral diet till full regimen.

We use industrial bag cheaper than home-made-

nutrition bag. Evaluation of nutrition effectiveness was made by monitoring value of albumin and pre-albumin every 4 days. During first disease week, patients hard suffer high amount of EN into duodenum, for that we prefer to administer parenteral mixture of LCT plus MCT, as Nutriplus 1875/ml B. Braun, Melsungen, EU.

Supply of EN was started at 20 ml/hour and increased every day 25 ml till full regimen; we initially used a polymeric diet mixture, and switching to an enriched one on fibers and glutamin at least 25 g/day, as soon as possible according to patient compliance.

Nutritional supply was provided mainly by carbohydrates, otherwise lipids are increasingly supplied as greater caloric burden on less fluid quantities. This is very important for a disease storing large quantity of fluids in retroperitoneal tissue.

Discussion regarding the use of antibiotic drugs is still open. Wide action of these drugs are used as antifungal purpose too. Today, great importance on relief of intra-abdominal pressure (IAP) is assumed, and it is possible with monitoring of pressure value on urinary bladder. Resolution of cholecystitis is important and possible by avoiding impact to pancreatic tissue of stones migration. When patient has got inflammation of gallbladder and liver enzymes increase, cholecystostomy does immediate improvement.

4) EN administration is started immediately after naso-jejunal feeding tube positioning. Nowadays, we perform it by endoscopic way, quicker and safer. In the past, usually we inserted Bengmark self-propelling naso-jejunal tube or on fewer cases so called Tiger Tube®, Cook Medical. Anyway, we emphasize importance of endoscopic service and not only to insert nutritional tubes, but also to remove necrotic debris by fistuloscopy. This procedures allow faster healing with the possibility to perform multiple procedures with good patient compliance. Fistuloscopy is proposed as complementary method after radiologic drainage, and integrated with other methods such as ultrasound -guided transgastric or transduodenal drainage.

CVC positioning is not indicated as first choice to supply nutrients to the patients, but to monitor patients haemodynamic status. Association between parenteral and enteral nutrition is the best way, preferred in ICU, on early stages.

5) CPR/PCT monitoring performed every 4 days is the best way to describe disease trend. First CT scan should be done at least 72 h after onset of disease just enough to demonstrate necrotic areas.

Subsequently CT scan was weekly performed during the first 6 weeks or only at onset of fever and abdominal pain. Magnetic Resonance (MR) scan could be useful to show biliary tree, anyway intolerance to MR execution makes useless this method.

Conclusion

Early EN from our experience is a real prophylaxis against infection, especially in case of severe pancreatitis, and then importance as source of nutrition for these patients. Moreover, use of EN allows to rationalize use of custom formulations for Parental Nutrition (PN). Nowadays too, there is not a magic bullet to treat severe pancreatitis without surgery, anyway with a large pool of pharmacological tools, we have obtained control of this dismal disease.

Fistuloscopy to remove septic debris is important because allowed repeated procedures without many troubles to patients till the complete cleaning of necrotic tissues.

SIRS associated with uncontrolled increase of intra-abdominal pressure must be treated by decompressive fasciotomy without peritoneum opening. This surgical approach improves patients outcome.

Lack of exact timing to resolve SAP invariably obtains an exhausting series of surgeries in most favourable cases.

Eventually, answering to difficult question “when we have to operate patients?”, we decide its fate. According to our experience in case of SAP is mandatory going through all treatment options, as patients are young, otherwise healthy, affected by non neoplastic but inflammatory disease, however severe which after few months from discharge have recovered to normal life.

References

1. Bradley EL III, Dexter ND. Management of severe acute pancreatitis: a surgical odyssey. *Ann Surg* 2010;251:6-17.
2. Beger HG, Rau B. Severe acute pancreatitis: clinical course and management. *World Journal Gastroenterol* 2007;14, 13:5043-5051.
3. Warndorf MG, Kurtzman JT, Bartel MJ, Cox M, Mackenzie T, Robinson S, Burchard PR, Gordon SR, Gardner TB. Early Fluid Resuscitation Reduces Morbidity Among Patients With Acute Pancreatitis. *Clin Gastroenterol Hepatol* 2011;8.
4. Brown A, Baillargeon JD, Hughes MD, Banks PA. Can fluid resuscitation prevent pancreatic necrosis in severe acute pancreatitis? *Pancreatology* 2002;2(2):104-7.
5. Linee Guida SINPE. *Riv Ital Nutr Parent Enter* 2002;S72.
6. Mangiante G, Chimetto A, Casaril A, Zugni C, Biasiutti C. La nutrizione artificiale (NA) nella pancreatite acuta grave: un concetto in involuzione. *Chir Ital* 2007 Jan-Feb;59(1):75-81.
7. Petrov M, Whelan K. Comparison of complications attributable to enteral and parenteral nutrition in Predicted severe acute pancreatitis: a systemic review and meta-analysis. *Br J Nutrition* 2010;103:1287-1295.
8. Bassi C, Mangiante G, Falconi M, Salvia R, Frigerio I. Prophylaxis for septic complications in acute necrotizing pancreatitis. *J Hepatobiliary Pancreat Surg* 2001;8:211-215.
9. Heidegger CP, Romand JA, Treggiari M, Pichard C. Is it now time to promote mixed enteral and parenteral nutrition for the critically ill patients? *Intensive Care Med* 2007;33:963-969.
10. McClave SA, Chang WK, Dhaliwal R, Heyland DK. Nutrition support in acute pancreatitis: a systematic review of the literature. *JPEN* 2006 Mar-Apr;30(2):143-56.
11. Navaneethan U, Swaroop Wege S, Chari ST, Baron TH. Minimally invasive techniques in pancreatic necrosis. *Pancreas* 2009;38:867-875.
12. Rodella L, Mangiante GL, Lombardo F, Catalano F, Cerofolini A, El Kheir W. Il ruolo della fistuloscopia nel drenaggio delle raccolte pancreatiche. *Ann Ital Chir* 2010;81:232-233.
13. Ke L, Ni HB, Zhi-hui T, Wei-qin Li, Ning Li, Jie-shou Li. Intra-abdominal pressure and abdominal perfusion pressure: which is a better marker of severity in patients with severe acute pancreatitis. *J Gastrointest Surg* 2011;11605-011.
14. van Baal MC, Kohout P, Besselink MG, van Santvoort HC, Benes Z, Zazula R, Rijkers GT, Gooszen HG. Probiotic treatment with Probioflora in patients with predicted severe acute pancreatitis without organ failure. *Pancreatology* 2012;12(5):458-62.
15. Borzellino G, Lombardo F, Minicozzi AM, Donataccio M, Cordiano C. Early laparoendoscopic rendezvous for acute biliary pancreatitis: preliminary results. *Surg Endosc* 2010;24(2):371-376.
16. McClave SA. Nutrition in pancreatitis. *World Rev Nutr Diet* 2013;105:160-168.