Surgery in Pancreatic Necrosis—Challenges and Outcomes in an Industrial Hospital

Ashok Chattoraj¹ · Sunil Kumar¹

Received: 28 October 2015 / Accepted: 30 October 2015 / Published online: 18 November 2015
© Association of Surgeons of India 2015

Abstract Twenty-seven cases of pancreatic necrosis were admitted and treated at our hospital from Jan 2010 till Jan 2015. Eight of these patients (29 %) underwent pancreatic necrosectomy. Of a total number of 957 patients admitted for acute pancreatitis, 27 patients (3 %) were diagnosed to have necrotizing pancreatitis. Of the 8 patients operated on, 5 patients (62.5 %) were treated successfully. The 3 patients who died had 3 organ (renal, respiratory and cardiovascular) failures. Nineteen patients of pancreatic necrosis responded to medical management and were successfully treated.

Keywords Necrosectomy · Pancreatitis · Gallstone · Necrosis

Introduction

Acute pancreatitis is a common disease seen in all major hospitals across the globe. There are numerous causes but the common ones are gallstones and alcohol. The course of the disease can range from a mild attack to severe a life-threatening situation complete with multi-organ failure and even death. Every case behaves differently and needs to be analysed and treated accordingly. In the event of the pancreas undergoing necrosis, the condition of the patient usually deteriorates, and unless active and aggressive intervention and treatment are started, these patients will have a high morbidity and mortality [1].

Aim

This research was conducted to study the outcome of patients with severe pancreatitis and with necrosis.

Materials and Methods

This study was carried out in Tata Main Hospital, Jamshedpur, India. The period of study was from 1 Jan 2010 till 30 Jan 2015. A total of 957 patients were diagnosed and treated in our hospital; 362 patients were females and 595 were males.

In the last 6 years, we had 27 cases of pancreatic necrosis (3 %) and 8 of them had to undergo surgery (0.8 %). The diagnosis of necrotizing pancreatitis was done by contrast-enhanced CT scan of the abdomen [2]. Those who were in sepsis/multi-organ failure and not responding to medical treatment with inj. meropenem 1 g IV 8 hourly were considered for surgery [1, 3, 4].

The diagnosed causes of acute pancreatitis were (1) cholelithiasis—59 cases (6.2 %), (2) alcohol—159 cases (16.6 %) and (3) idiopathic/other causes—699 cases (77.2 %) (Fig. 1).

Male to female ratio=595:362 (Fig. 2). Male to female ratio=2:3.

The commonest age group affected was between 41 and 60 years of age (Fig. 3).

The criteria for diagnosing pancreatitis were clinical, haematological, biochemical and imaging studies [5, 6].

Observations

The physical, biochemical and imaging details of the eight cases are shown in Table 1. Three patients died

✉ Ashok Chattoraj
drachattoraj@tatasteel.com; akchattoraj@gmail.com

¹ Department of Surgery, Tata Main Hospital, Jamshedpur, Jharkhand, India

Fig. 1 Diagnosed causes of acute pancreatitis **Fig. 2** Male to female ratio **Fig. 3** Agewise distribution of individuals affected

Table 1 The physical, biochemical and imaging details of the eight cases [7]

No.	Age (years)	Duration (h)	TLC	S. amylase (U/L)	S. lipase (U/L)	LDH	S. cal. (mg/dL)	AST	PaO ₂ (mmHg)	RBS (mg/dL)	Base def.	USG	CECT abdomen
1	34	7	16,300	1200	800	350	9	180	58	100	−2.8	Inf	Necrosis
2	57	11	15,500	1000	700	370	8.6	190	55	110	−3.6	Inf	Necrosis
3	47	12	26,200	1200	1000	350	9.2	200	60	130	−4.6	Inf	Necrosis
4	54	6	17,000	850	700	270	8.6	160	70	106	−4.1	Inf	Necrosis
5	60	7	14,000	1100	1200	300	8.8	120	55	95	−3.8	Inf	Necrosis
6	47	10	15,000	1250	1000	350	10	180	60	124	−2.9	Inf	Necrosis
7	51	6	18,000	800	650	250	9.5	210	60	96	−2.8	Inf	Necrosis
8	39	8	21,000	1400	1000	270	8.2	240	58	102	−5.0	Inf	Necrosis

Inf inflamed pancreas

due to severe sepsis and multi-organ failure—respiratory, renal and cardiovascular. Five patients were operated on between 17 and 23 days of onset of symptoms [3, 4, 8].

All the patients underwent laparotomy along with pancreatic necrosectomy (Figs. 4 and 5). The necrotic pancreas was excised and thorough lavage given with warm normal saline. Two wide-bore (30 F) tubes were placed at the site of the necrotic pancreas [5, 6, 9–11]. The discharge was monitored and it varied from 150 to 180 mL in the first 24 h, reducing to 20–60 mL by the 5th post-operative day. The drains were removed only when the discharge was less than 5 mL, which was between the 7th and 10th post-operative days. All patients had mild serous wound discharge from the main wound site which healed completely.

All these patients were given inj. meropenem 1 g IV 8 hourly for 15 days.

Post-operatively, all the patients needed ventilator support which was gradually weaned and removed by the 6th to 10th days. Post-operatively, extensive chest physiotherapy, early ambulation and limb movement (both active and passive) were done to reduce the chances of thrombo-embolism [6]. We routinely do not put our patients on anticoagulants like heparin post-operatively.

Total parenteral nutrition was given till the patient had a bowel movement or passed flatus. A close watch on abdominal girth was kept. Early oral feeding was begun once the patient felt better and the pulse rate, BP, temperature and SaO₂ were normal.

Blood sugar was monitored 8 hourly and inj. plain insulin was advised where there was hyperglycaemia.

Fig. 4 Necrotic pancreas **Fig. 5** Excised necrotic pancreas

Table 2 Post-operative clinical and biochemical results (day 2) [7]

No.	BP (mmHg)	Urine (mL/24 h)	CVP (cm H ₂ O)	pH	TLC	PT/INR (s)	Lactate	S. creatinine (mg/dL)	PaO ₂ /PaCO ₂
1	94/62	900	14	7.22	17,000	1.4	−3.1	1.6	82/50
2	112/70	1100	12	7.3	14,400	1.6	−2.6	1.1	86/40
3	92/60	850	8	7.12	23,500	1.6	−4.2	1.8	84/55
4	122/82	1400	10	7.36	14,000	1.2	−2.1	1.2	78/60
5	104/68	1600	9	7.24	16,200	1.4	−2.4	1.2	83/55

In three patients, serum calcium was less than 9 mg/dL, and they were treated with inj. calcium gluconate till the serum calcium levels became normal.

The patients were discharged between the 15th and 20th post-operative days. They are on regular follow-up. The mortality rate amongst the operated cases was 3/8 (37.5 %).

Discussion

In our study, we had more cases of alcoholic pancreatitis. Other studies have a higher incidence of gallstones. There are many cases where no definite cause could be found.

In the vast majority of cases, acute pancreatitis can be managed conservatively [8]. Where a definite cause like gallstones or alcohol is present, it is treated accordingly. Majority of cases of necrotizing pancreatitis respond well to medical management. However, there is a small subset of patients who are in multi-organ failure and sepsis and do not respond to medical treatment. This group needs operative management [5, 6, 9–11].

We have found that the ideal time of surgery is on the 21st day±3 days. At this time, necrosectomy can be done with optimum results [8].

Post-operative care is very challenging in these sick patients and will need the services of surgeons,

physicians, intensivists, nutritionists, physiotherapists and nurses.

Conclusion

Most cases of acute pancreatitis are mild in nature. It responds well with medical management. Where a definite cause is present, it needs to be treated (like cholecystectomy). A smaller percentage presents as severe pancreatitis where it is a challenge to treat these patients. They need intensive monitoring and support. They too can be treated medically. A smaller subset develops pancreatic necrosis whose initial management is again medical. Only in patients with necrotizing pancreatitis who are in severe sepsis and multi-organ failure and who do not respond to medical treatment should surgery be considered [1]. The timing of the surgery is crucial, with the best results being obtained around the 3rd week of the disease [8]. Post-operative care is very crucial and needs a multi-disciplinary approach.

In our series, we observed a relation of clinical findings like hypotension, fever and hypoxia; haematological findings like leukocytosis; arterial blood gas suggestive of elevated lactate levels; and altered PaO₂ and PaCO₂ levels with poor prognosis (Tables 2 and 3) [1, 2].

Patients with oliguria and azotemia along with these findings have a worse prognosis.

Table 3 Post-operative clinical and biochemical results (day 7) [7]

No.	BP (mmHg)	Urine (mL/24 h)	CVP (cm H ₂ O)	pH	TLC	PT/INR (s)	Lac.	S. creatinine (mg/dL)	PaO ₂ /PaCO ₂
1	122/70	1600	11	7.36	13,000	1.4	−1.2	1.2	98/45
2	130/80	1500	10	7.32	10,800	1.1	−1.4	1.1	90/40
3	118/82	1500	11	7.4	13,200	1.1	−1.8	0.8	100/40
4	132/88	1700	10	7.34	9000	1.2	−1.8	1.2	88/50
5	116/86	1600	11	7.42	10,200	1.1	−2.2	1.2	95/45

References

1. Imrie CW, McKay AJ, Boyle P (2013) Prognostic factors in the assessment of the severity of primary acute pancreatitis. *13*(3): S8-S8
2. Leung T, Lee CM, Lin SY et al (2005) Balthazar computed tomography severity index is superior to Ranson criteria & APACHE II scoring systems in predicting acute pancreatitis outcome. *World J Gastroenterol* 11(38):6049–6052
3. British Society of Gastroenterology (1998) United Kingdom guidelines for the management of acute pancreatitis. *Gut* 42(Suppl 2):S1–S13
4. Working Party of the British Society of Gastroenterology, Association of Surgeons of Great Britain and Ireland, Pancreatic Society of Great Britain and Ireland, Association of Upper GI Surgeons of Great Britain and Ireland (2005) UK guidelines for the management of acute pancreatitis. *Gut* 54(Suppl 3):1–9, iii
5. Wada K, Takada T, Hirata K et al (2010) Treatment strategy for acute pancreatitis. *J Hepatobiliary Pancreat Sci* 17(1):79–86
6. Babu B, Sheen AJ, Lee SH et al (2010) Open pancreatic necrosectomy in the multidisciplinary management of post inflammatory necrosis. *Ann Surg* 251(5):783–786
7. Rau B, Schilling MK, Beger HG (2004) Laboratory markers of severe acute pancreatitis. *Dig Dis* 22(3):247–257
8. Wittau M, Scheele J, Gözl I, Henne-Bruns D, Isenmann R (2010) Changing role of surgery in necrotizing pancreatitis: a single-center experience. *Hepato-Gastroenterology* 57(102–103): 1300–1304
9. Traverso L, Kazarek RA (2005) How I do it: pancreatic necrosectomy. *J Gastrointest Surg* 9(3):436–439
10. Werner J, Hartwig W, Hackert T et al (2005) Surgery in the treatment of acute pancreatitis—open pancreatic necrosectomy. *Scand J Surg* 94(2):130–134
11. Rodriguez J, Razo AO, Targarona J et al (2008) Debridement and closed packing for sterile and infected necrotizing pancreatitis: insights into indications and outcomes in 167 patients. *Ann Surg* 247(2):294–299