



## Original research

# Emergency pancreaticoduodenectomy: When is it needed? A dual non-trauma centre experience and literature review



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## HIGHLIGHTS

- Pancreaticoduodenectomy is nowadays a standardized operation in high volume centers.
- Emergency pancreaticoduodenectomy is performed as life-saving procedure in selected patients.
- Emergency pancreaticoduodenectomy is indicated where a less demolitive approach is unavoidable.

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## ABSTRACT

**Introduction:** Emergency pancreaticoduodenectomy (EPD) has been very rarely reported in literature as a lifesaving procedure for complex pancreatic injury, uncontrollable hemorrhage from ulcers and tumors, descending duodenal perforations, and severe infection. The aim of this study was to analyze the experience of two non-trauma centers and to review the literature concerning emergency pancreaticoduodenectomy.

**Methods:** From January 2005 to December 2014, from a population of 169 PD (92 females and 77 males; mean age: 61.3, range 23–81) 5 patients (3%; 2 females and 3 males; mean age: 57.8, range: 42–74) underwent EPD for non-traumatic disease performed at two Academic Units of the University of Bari.

**Results:** The emergency pancreaticoduodenectomy subgroup of patients showed an overall morbidity of 80%, and mortality of 40%. In 80% (4/5) of patients treated by emergency pancreaticoduodenectomy, the pancreatic remnant was not reconstructed, and in 20% (1/5) a pancreaticojejunostomy was performed.

**Conclusion:** Emergency pancreaticoduodenectomy is an effective life-saving operation reservable to pancreatoduodenal trauma, perforations, and bleeding, unmanageable by a less invasive approach. It should be preferentially approached by surgeons with a high level of experience in hepatobiliary and pancreatic surgery and in trauma centers too, but it should also be in the armamentarium of general surgeons performing hepato-pancreato-biliary surgery.

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## 1. Introduction

Emergency pancreatic surgery is a very uncommon event,

usually connected to abdominal trauma, although it is also occasionally described for pancreatitis, ruptured aneurysms, bleeding pseudocysts, and progressive multiple organ failure in severe necrotizing pancreatitis [1]. Pancreaticoduodenectomy (PD) is a formidable operation, first described in 1935 by Whipple [2], for the cure of the periampullary tumors and, more recently, for benign diseases too, like chronic pancreatitis, duodenal cystic dystrophy, large adenomas, diverticula and benign periampullary tumors [3,4]. Emergency PD (EPD) has been rarely reported in literature as a lifesaving procedure for complex pancreatic injury, uncontrollable hemorrhage from ulcers and tumors, descending duodenal

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perforations, like in our previous experience [5], and severe infections [6,7]. While mortality rate of PD in elective surgery has shown a significant decrease during the last three decades, with an incidence of <5% in high volume centers, it remains high for EPD, until recently reporting mortality rates of 30%–40% [8,9]. However, given its rarity, there is still little data in literature on EPD, mostly in non-trauma patients.

The aim of this study was to analyze our experience of two non-trauma centers, and to review the literature concerning EPD.

## 2. Material and methods

From January 2005 to December 2014, from a population of 169 PD (92 females and 77 males; mean age: 61.3, range 23–81), 5 patients (3%; 2 females and 3 males; mean age: 57.8, range: 42–74) underwent EPD performed at two Academic Units of the University of Bari. In 101 (59.8%) cases a *Whipple* and in 68 (40.2%) a *Traverso-Longmire* procedure were respectively performed. In 155 (94.5%) cases, the indication to PD was malignancy, in 9 (5.5%) it was symptomatic chronic pancreatitis. The details of patients undergoing EPD are summarized in Table 1. In all patients treated in elective surgery, the pancreatic remnant was reconstructed, in 86 by pancreaticojejunostomy, in 74 by pancreaticogastrostomy, and in 9 by duct-to-mucosa pancreaticojejunostomy. Overall morbidity rate was 30.1% (51/169), and mortality rate was 1.8% (3/169).

## 3. Results

The mean postoperative hospital-stay of patients who underwent EPD was 73.6 days (range: 35–110), morbidity was 80%, and mortality rate was 40%. In 80% (4/5) of patients treated by EPD, the pancreatic remnant was not reconstructed, and in 20% (1/5) a pancreaticojejunostomy was performed.

### 3.1. Patient 1

A 66-year old woman was transferred to our surgical unit 5 days after laparoscopic cholecystectomy with diffuse peritonitis and septic shock. An emergency CT-scan confirmed a massive abdominal effusion, with a suspected descending duodenal wall rupture. An emergency laparotomy was performed and severe biliary peritonitis due to a large laceration resulting from electrocautery damage of the lower duodenal knee was confirmed (Fig. 1). An emergency *Whipple* procedure with pancreaticojejunal anastomosis was performed. During the postoperative period a conservatively managed pancreatic fistula (POPF) was observed. The patient was discharged 59 days after operation.

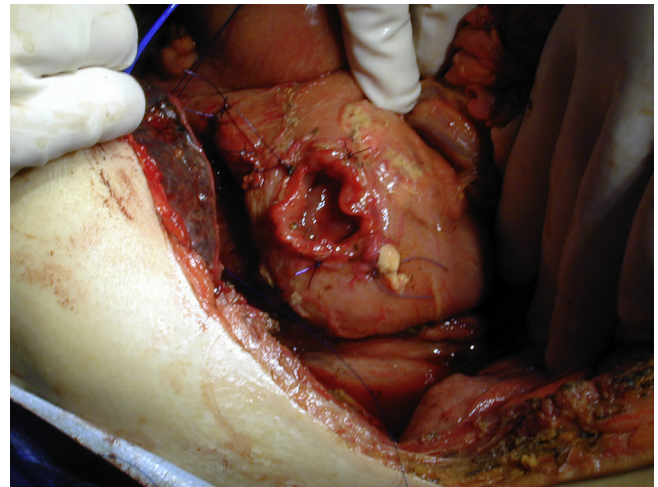


Fig. 1. Laceration resulting from electrocautery damage of the lower duodenal knee.

### 3.2. Patient 2

A 64-year old man, operated for a cerebral glioblastoma two months earlier, presented jaundice with a stable level of conjugated bilirubin at 7.0 mg/dl and repeated episodes of pancreatitis caused by a non-endoscopic-resectable ampulloma of the Vater's papilla. After repeated biopsies of the lesion demonstrating a moderate grade dysplasia, he underwent surgical ampullectomy with reinsertion of choledochus and *Wirsung's* duct at our Academic hospital. The operation was necessary to permit chemotherapy for glioblastoma. Unfortunately, on the 10th post-operative day, the patient had a dehiscence of the duodenal suture with biliary peritonitis confirmed by CT-scan. An emergency *Whipple* operation was performed with the closure of the pancreatic remnant. The patient died 45 days after the EPD, due to MOF. Surprisingly the pathologic examination of the specimen showed a diffuse infiltration of the surgical wound by poorly differentiated biliary malignant cells.

### 3.3. Patient 3

A 44-year old man developed a post-ERCP pancreatitis for gallstones disease, and was assisted for two months in the ICU before being transferred to our surgical unit for complex care. During the stay, the patient developed a large area of infected necrosis at the level of the head and body of pancreas, as demonstrated by a CT-scan; failure of antibiotic therapy to control the sepsis lead to surgical intervention. A *Traverso-Longmire* EPD with closure and drainage of the healthy pancreatic tail was performed.

Table 1  
Details of patients underwent to EPD.

Pts	Primary procedure	Sex	Age, yr	Diagnosis	Means of diagnosis	Length of stay, d	Type of operation	Outcome
1	Postsurgical complication	F	66	Duodenal perforation following laparoscopic cholecystectomy	Clinical decision, CT scan	59	EPD + PJ	Survival
2	Postsurgical complication	M	74	Dehiscence of duodenal suture postampullectomy	Clinical decision, CT scan	89	EPD + CPS	Death
3	Postendoscopic complication	M	44	Severe necrotizing pancreatitis post ERCP	Clinical decision, CT scan	75	EPD + CPS	Death
4	Postsurgical complication	M	42	Dehiscence of cystojejunostomy for pancreatic pseudocyst	Clinical decision, CT scan	110	EPD + CPS	Survival
5	Postsurgical complication	F	63	Delayed duodenal perforation by foreign body following cholecystectomy	Clinical decision, CT scan	35	EPD + CPS	Survival

PJ indicates pancreaticojejunostomy; CPS indicates closure of the pancreatic stump; PG indicates pancreaticogastrostomy.

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