Abstract. – OBJECTIVE: With improvement in methods, mortality after duodeno-cephalo pancreatectomy (DCP) has decreased to 5% even if complication rate is still high (30-50%). The pancreatic fistula still occurs in 25-50% of cases. Various methods of treating pancreatic stump have been proposed aimed to improve this rate.

PATIENTS AND METHODS: The AA, surgeons of suburban hospital, have performed in five years, 2008-2013, 12 DCP. The pancreatic anastomosis has been in all cases an end-to-end duct-to-mucosa pancreatic-jejunostomy.

RESULTS: The prevalence of fistula has been 33% (4 cases, 3 grade A and 1 grade B according with ISGPF score).

CONCLUSIONS: Soft pancreas and small size of pancreatic duct are recognized as the major factor of risk for pancreatic fistula. In these cases are usually preferred pancreatic-jejunos tomomy (PJ) and pancreatic-gastro-anastomosis (PG). Both techniques show advantages and disadvantages: some randomized and prospective studies have demonstrated the absence of significative differences respect to the prevalence of pancreatic fistulas. Whipple method has been the most often used reconstructive method: a single loop with bile-pancreatic anastomosis and gastro-pancreatic anastomosis in sequence. A careful evaluation of pancreatic tissue and Wirsung size with the aim of choosing the most suitable technique and an accurate execution are the most effective methods to prevent pancreatic fistula, even considering particular setting as elderly patient or HIV infection.

Key Words: Pancreatic-jejunos tomomy anastomosis (PJ), Pancreat ic-gastro-anastomosis (PG), End-to-end pancreatic-jejunum anastomosis duct-to-mucosa.

Introduction

One of the most critical points in duodeno-cephalo-pancreatectomy (DCP) for periampullary cancer is the treatment of the pancreatic stump because of its impact on perioperative morbidity and mortality.1-3 Nowadays, mortality has decreased to 5%, even though the overall complication rate is still high (30-50%).4-6 The most common complications after DCP are:

1) Pancreatic fistula (25-50%), as a consequence of anastomotic leakage. It can be either subclinical, when revealed only after a contrast-enhanced imaging of Wirsung duct, or clinical. Mortality for this complication is about 30%. Risk factors for pancreatic fistula are a soft pancreatic structure and a small and deep Wirsung duct7-9;
2) Late gastric emptying (10-30%)10;
3) Haemoperitoneum (5-8%)11;
4) Hepatic-jejuno-stomy leakage (2-5%) with biliary fistula and localized bile collection12;
5) Wound infection10;
6) Intra abdominal abscess10.

Patients and Methods

Between June 2008 and June 2013, 12 Duodenoc-cephalo-pancreatectomy have been performed at The Surgery Unit of Basso-Ragusa-Mario Hospital, in Militello in Val di Catania. Indication for surgery was in 7 cases pancreatic head cancer, in 4 ampulloma, and in the last one cholangiocarcinoma of the distal common bile duct; the patients were six males and six females, mean age 72, range 52-83. In all cases, an endo-to-end duct-to-mucosa pancreatic-jejunos tomomy was carried on. A stent has been left to protect the anastomosis in all cases.

Results

The most frequent complication was, in 4 cases, a pancreatic fistula grade A (3 cases) or B (1 case) (in the ISGPF score)13, an haemoperitoneum occurred in case, causing the exitus.

Discussion

Since the introduction of pancreaticoduodenectomy by Whipple, the problem of treatment of pancre-
Treatment of the pancreatic stump after DCP

Peng et al in 2007 reported the results of a prospective trial comparing a group of 111 pancreatico-jejunostomy undergone the conventional anastomosis with 106 cases in which was performed the so-called “binding pancreatico-jejunostomy”. This method aimed to obtain a safer anastomosis by “binding” 3 cm of jejunal wall around the intussuscepted pancreatic stump. The results were interesting, showing no fistulas in the group “binding pancreatico-jejunostomy” while with conventional anastomosis 8 patients out of 111 developed pancreatic fistulas 9,20 (7.2%).

A further issue regards the need for an anastomotic stent and the type of stent itself, disposable and according to Walker 15,21.

A prospective, randomized study, setup by Rodert al (1999) 22 showed a decrease of pancreatic fistula from 29% to 7% with stenting while other studies failed to show any advantage 8,18.

There are a lot of proposals of rebuilding of digestive continuity 22:

1) The classic Whipple technique is still the most diffuse. In this method, pancreatic, biliary and gastric anastomoses are performed on a same jejunal loop. It is considered safe and easy thanks to the minimum number of anastomoses;

2) Pancreatico-jejunostomy on a defunctioning loop; in this case a defunctioning loop is interposed between the biliodigestive anastomosis and the enterogastric anastomosis 16;

3) Pancreatico-jejunostomy on a defunctioning loop with biliodigestive anastomosis and enterogastric anastomosis onto the same loop 8;

4) Enterogastric anastomosis on a defunctioning loop (pancreaticojejunostomy and biliodigestive anastomosis onto the loop) 24.

Advantages of this technique are linked to the possibility of creating a “pure pancreatic fistula” after a leakage.

In 1946, Waugh and Clagett 25,26 proposed the pancreatic-gastro (P-G) anastomosis, because of many theoretical advantages: the proximity of the two organs and a tension free anastomosis, the possibility of improving the anastomotic perfusion due to the rich gastric vascularization, distance of biliodigestive anastomosis with lower risk of complications, neutralization of pancreatic enzyme by the acid gastric secretion, insertion of nasogastric tube to control amylase levels instead of radiologic and endoscopic examination.

Prospective and randomized studies of Yeo et al 27 and Bassi et al 28 (compared the different techniques: they have not found differences in

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**Table 1.** Incidence of pancreatic fistula in Bartoli’s meta-analysis 17.

<table>
<thead>
<tr>
<th>Type of anastomosis</th>
<th>Cases (N)</th>
<th>Pancreatic fistulas (N)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duct-to-mucosa</td>
<td>741</td>
<td>85</td>
<td>11.5</td>
</tr>
<tr>
<td>End-to-Side</td>
<td>583</td>
<td>96</td>
<td>16.5</td>
</tr>
<tr>
<td>End-to-End</td>
<td>1037</td>
<td>121</td>
<td>11.7</td>
</tr>
</tbody>
</table>
risk of pancreatic fistula but they have measured a decrease in bile fistula incidence, abdominal complications and late gastric emptying. Yin Feng Shen et al published a meta-analysis of a randomized and controlled trials by a literature review: between 1990 and 2011 about 397 studies were collected, and 4 entered meta-analysis. These 4 studies compared 276 P-G anastomosis e 277 P-J anastomosis. No statistic differences were found in mortality for pancreatic fistula, bile fistula, intra abdominal complications and late gastric emptying.

Many other factors, different from anatomical patterns, can affect the incidence of pancreatic fistula, among these the age and the presence of comorbidities like HIV infections.

Conclusions

DCP can be considered a difficult technique associated with high risk of complications; in 1979, Moussa defined it as “the Cadillac of abdominal surgery.”

Several techniques exist, and few are poor of complications: the surgeon has to decide which is the most suited, considering anatomo-pathological and anatomo-topographical conditions of the organ, the size of Wirsung and also the particular setting of dominalsurgery.”

Many authors declare that they have no conflict of interests.

Conflict of Interest

The Authors declare that they have no conflict of interests.

References


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