ISSN 2689-8268 | Volume 5

American Journal of Surgery and Clinical Case Reports

Research Article Open Access

Whipple Procedure: A 10-Year Experience in Hayatabad Medical Complex

Hussain M, Jan Y*, Neelma, Aman Z, Yasir M, Zahid A and Javed M

Department of General Surgery, Hayatabad Medical Complex Peshawar, Pakistan

***Corresponding author:**

Yousaf Jan,
Department of General Surgery, Hayatabad Medical Complex Peshawar, Pakistan,
E-mail: yousafjanshinwari7@gmail.com

Received: 13 Jun 2022
Accepted: 30 Jun 2022
Published: 06 Jul 2022
J Short Name: AJSCCR

Keywords:

Complications; Mortality; Pancreatic neoplasms; Whipple

Citation:

Jan Y. Case. Whipple Procedure: A 10-Year Experience in Hayatabad Medical Complex. Ame J Surg Clin Case Rep. 2022; 5(2): 1-4

1. Abstract

1.1. Background: Pancreatic cancer is more common in older patients. The only approach to get rid of these resectable tumours appears to be pancreaticoduodenectomy also knows as whipple's procedure. In 1935, Allen. O Whipple described pancreaticoduodenectomy as a modified technique for the first time. Once thought to have a significant mortality rate, the procedure is currently used with a mortality rate of less than 5%. This is a case study based on a ten-year experience with the Whipple procedure at Hayatabad Medical Complex Peshawar.

1.2. Material and Methods: This was a retrospective case series conducted at Surgical Department Hayatabad Medical Complex Peshawar from January 2009 to December 2019. Patient surgery details were gathered from the surgical records of the operating room and their clinical records from the hospital archives. Data was analyzed with SPSS 27.0 for windows. A Demographic data, presenting symptoms, physical signs, past medical history, preoperative stenting details, intra operative duration of surgery, postoperative course and complications, pathology, and causes of postoperative death were collected on a pre-designed proforma. Data were entered and analyzed by using SPSS 27.0.

1.3. Results: Age ranged between 30 to 75 years with a mean age of 52.5 ± 05 years. Mean operative time was 361±42.5 minutes and intra-operative blood transfusion was approximately 2.0 pack cells each operation. The mean hospital stay was 11.5±5.9 days. Female patients were 15(44.1%) while 19(55.9%) were males. Presenting symptom of the patients were: jaundice 18(52.9%), abdominal pain 7(20.5%), vomiting 4(11.8%), fever 3(8.8%) and weight loss 2(5.9%). Most common complication after surgery was delayed gastric emptying 10(29.4%) followed by GI leakage 7(20.6%), biliary fistula 6(17.6%), Pancreatic fistula 4(11.8%), cholangitis 3(8.8%), hemorrhage 2(5.9%), renal failure 1(3.9%) & wound infection 1(3.9%).

1.4. Conclusions: The most prevalent complication of the Whipple operation was delayed gastric emptying & obstructive jaundice. Adenocarcinoma was the most common histology. This study's mortality rate is slightly greater. It can be concluded that using meticulous surgical technique, strict hemostasis, and standard critical care postoperatively, morbidity and mortality of the Whipple surgery can be reduced.

2. Introduction

Pancreatic cancer is the fourth leading cause of death in the Western Hemisphere and one of the leading causes of death in Eastern countries [1]. Only a small percentage of people can live for more than 5 years with this illness. The majority of patients are in advanced stages of the disease, with only 10% to 20% of them having a resectable mass [2]. The size of the tumour, degree of differentiation, status of resected lymph nodes, and involvement of the resected margins are all indicators that can help predict prognosis. The post-resection CA 19-9 level and tumour DNA content were also considered as predictive variables in few studies [3, 4]. Surgery was the only way to cure pancreatic cancer among the different treatments [5]. Pancreatic cancer predisposing factors are unknown, although tobacco is the most likely cause. Longer exposure to smoke and more cigarette use increase the risk. There is some evidence that drinking alcohol, caffeine, or taking aspirin are among the risk factors [6, 7]. Patients with blood types A, B, or AB, as well as those with a history of diabetes or chronic pancreatitis, chronic cirrhosis, and diabetes are all risk factors. Only about 5% to 10% of these patients have a positive pancreatic cancer family history [8].

Allen. O Whipple described pancreaticoduodenectomy for the first time in 1935, when he modified a method previously performed by Alessendro Codinivillan in Italy and Walter Keusch in Germany

[9].

In recent years, the Whipple technique has become a standard treatment for benign and malignant pancreatic neoplasms, peri-ampullary carcinomas, and cholangiocarcinoma. Delayed gastric emptying, bleeding, leakage of the GI anastomosis, wound infection, and intraabdominal abscess are the most prevalent complications, all of which effect mortality, morbidity, hospitalisation & expenses [10, 11].

The goal of this study was to evaluate the Whipple procedure from 2009 to 2019 in our hospital by analyzing the figures pertaining to the presenting signs and symptoms, postoperative clinical outcomes, and hospitalizations.

3. Materials & Methods

This was a retrospective case series conducted at Surgical Department of Hayatabad Medical Complex Peshawar from January 2009 to December 2019. Total 34 patients were included in the study. Ethical approval was obtained from the Institutional Review Board / Hospital Ethical Committee. Patients of both gender, age ranged between 30-75 years with a mean age of 52.5 years presenting with obstructive jaundice, weight loss, or vomiting with evidence of a mass in the pancreas on CT scan were included in the study. Patients with distant metastasis, superior mesenteric artery involvement, or extensive portal vein involvement were considered unresectable, hence excluded from the study. Statistical analysis was done using SPSS 27.0. Quantitative data were presented by using mean ± SD. Qualitative data were presented by using frequency tables and percentages. P value ≤0.05 was considered statistically significant.

4. Results

Total 34 procedures were performed from January 2009 till December 2019. Age ranged between 30 to 75 years with a mean age of 52.5 ± 05 years. Mean operative time was 361±42.5 minutes and intra-operative blood transfusion was approximately 2.0 pack cells each operation. The mean hospital stay was 11.5±5.9 days. Female patients were 15(44.1%) while 19(55.9%) were males (Figure 1).

Presenting symptom of the patients were: jaundice 18(52.9%), abdominal pain 7(20.5%), vomiting 4(11.8%), fever 3(8.8%) and weight loss 2(5.9%) (Figure 2).

Most common complication after surgery was delayed gastric emptying 10(29.4%) followed by GI leakage 7(20.6%), biliary fistula 6(17.6%), Pancreatic fistula 4(11.8%), cholangitis 3(8.8%), hemorrhage 2(5.9%), renal failure 1(3.9%) & wound infection 1(3.9%) (Table 1).

12 (35.3%) cases needs re admission, nausea and vomiting are the most common reason 4(11.8%), followed by pneumonia 3 (8.8%), wound infection 2(5.9%), intra-abdominal abscess 2(5.9%) & GI bleeding 1(2.9%) respectively (Table 2).

6(17.6%) cases had benign lesions, while 28(82.4%) had malignant. In benign cases, serious adenoma of the pancreas 4(11.8%) being the common type followed by non-specific fibrosis of pancreatic head 2(5.9%). Malignant pathologies were, adenocarcinoma 12(35.2%), pseudo papillary carcinoma 8(23.5%), Cholangio carcinoma of distal CBD 4(11.8%), Neuro endocrine tumour 2(5.9%), granulocytosis paraganglionoma 1(2.9%) & duodenal large-cell malignant lymphoma 1(2.9%) respectively (Table 3).

8(23.5%) patients expired in the first 30 days. Most frequent cause of mortality was massive GI bleeding 4(11.8%) followed by septic shock 3(8.8%) & Hemorrhage 1(2.9%) respectively (Table 4).

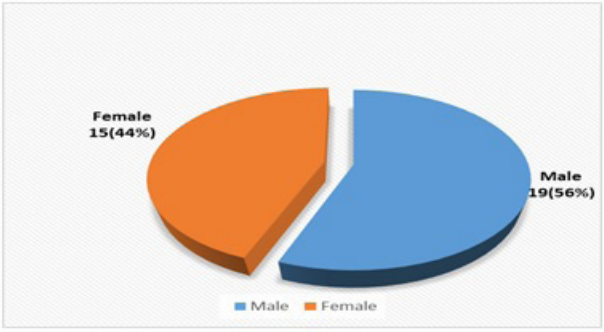

Figure 1: Gender distribution

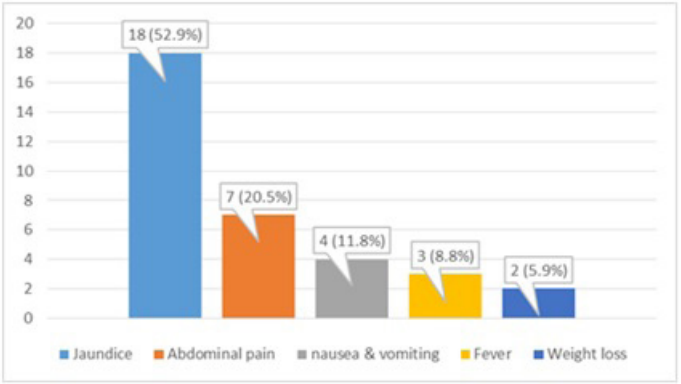

Figure 2: Presenting symptoms of the patients

Table 1: Postoperative Complications

Complications	Number	Percent
Delayed gastric emptying	10	29.40%
GI leakage	7	20.60%
Biliary fistula	6	17.60%
Pancreatic fistula	4	11.80%
Cholangitis	3	8.80%
Hemorrhage	2	5.90%
Renal failure	1	3.90%
Wound infection	1	3.90%

Table 2: Reason for Re-admission (n=12)

Reason for re admission	Frequency	Percentage
Nausea & vomiting	4	11.80%
Pneumonia	3	8.80%
Wound infection	2	5.90%
Intra-abdominal abscess	2	5.90%
GI bleeding	1	2.90%

Table 3: Histological diagnosis of patients

Histological diagnosis	Frequency	Percentage
Benign (n=6)		
Serious adenoma of the pancreas	4	11.80%
Non-specific fibrosis of pancreatic head	2	5.90%
Malignant (n=28)		
Adenocarcinoma	12	35.20%
Pseudo papillary Ca	8	23.50%
Cholangio Ca of CBD	4	11.80%
Neuro endocrine tumour	2	5.90%
Granulocytosis paraganglionoma	1	2.90%
duodenal large-cell malignant lymphoma	1	2.90%

Table 4: Mortality (n=8)

Cause of mortality	Frequency	Percentage
Massive GI bleed	4	11.80%
Septic shock	3	8.80%
Hemorrhage	1	2.90%

5. Discussion

The Whipple technique is one of the most common surgeries in the field of general surgery. Once thought to be a high-risk treatment, is now routinely performed in tertiary care hospitals with mortality rates of <5% [12]. The Whipple procedures, on the other hand, have a high morbidity rate. One of the most prevalent short-term problems is delayed gastric emptying, GI leak and ascending cholangitis is considered the most frequent long-term complication. As a result, it is critical to develop the skills needed to avoid these complications and to diagnose them quickly enough to treat the patient appropriately. Our 10-year experience with Whipple's technique in terms of preoperative, operative, and postoperative characteristics of patients having surgery is described in this article [13].

In this study, 34 patients with neoplasms of the pancreas, periampullary area, and duodenum received Whipple surgery. Patients ranged in age from 30 to 75 years old, with 19 (55.9%) males and 15 (44.1%) females. The average age of the patients was 52.5 years, which is almost similar to a research conducted by Shabbar H et al in 2020 [14]. Obstructive jaundice was the most prevalent presenting symptom. Ten of the 18(58.9%) patients with jaundice received preoperative biliary stenting by endoscopic retrograde biliary stenting and had bilirubin levels greater than 20 mg/dl. Although preoperative stenting reduced bilirubin levels, it increased the difficulty level since it lengthened the operating duration due to periampullary fibrosis.

The average time of the Whipple procedure in the study was 361 minutes, which is quite less than that of Amir Saree et al (376 minutes) [15]. Average amount of blood transfusion during surgery was 2.0 pack cells, which was slightly more than in prior study of Shabeer H et al [14]. In comparison to prior studies the average length of stay in hospital was shorter in this study [14, 15].

The Whipple technique is a lengthy treatment with a high rate of morbidity. Pancreatic fistula, gastric emptying, bleeding, wound infection, and enteric leakage are all common problems after surgery, late gastric emptying was the most common consequence in this study, accounting for 29.4% of patients. In a systematic assessment of 11 large centres, Halloran et al found pancreatic fistula in 10.4% of cases, which is similar to our study [16]. While Matsumoto et al found pancreatic fistula in 4.2% & Romano et al found pancreatic fistula in 4.12% of cases, which is in contrast to our findings [17, 18]. These studies have a lower rate of pancreatic fistula formation than the current study, which can be ascribed to surgical approach.

In this study, 5.9% of patients developed hemorrhage which is similar as compared to other studies.19 Wound infection occurred in 7% of cases which is comparable with other studies [20]. Finally mortality rate in this study was higher as compared to other studies which can be attributed to a lack of advanced critical care services [21, 22].

Histopathological data of the resected specimen showed that the most common histological finding was adenocarcinoma of pancreas followed by solid pseudo-papillary carcinoma and cholangio-carcinoma of CBD. Similar results were also found in other studies with pancreatic adenocarcinoma being the common indication of the Whipple procedure [23].

6. Conclusions

Perioperative measures such as mean operative time, mean blood loss during surgery and mean length of hospital stay were comparable to those found in other studies, however the mortality rate was slightly greater in this study. It may be concluded that using meticulous surgical technique, strict hemostasis secure and routine postoperative critical care can reduce morbidity and mortality rates.

References

1. Schnelldorfer T. Forgotten pioneers of pancreatic surgery: beyond the favorite few. Ann Surg. 2008; 247: 191-202.
2. Huang JJ. Quality of life and outcomes after pancreaticoduodenectomy. Ann Surg. 2000; 231(6): 890-8.
3. Suzuki Y, Fujino Y, Ajiki T, Ueda T, Sakai T, Tanioka Y, Kuroda Y. No mortality among 100 consecutive pancreaticoduodenectomies in a middle-volume center. World J Surg. 2005; 29: 1409-14.
4. Karim SA, Abdulla KS, Abdulkarim QH, Rahim FH. The outcomes and complications of pancreaticoduodenectomy (Whipple procedure): cross sectional study. Int J Surg. 2019; 52: 383-7.
5. Feldmann G, Beaty R, Hruban RH, Maitra A. Molecular genetics of pancreatic intraepithelial neoplasia . J Hepatobiliary Pancreat Surg. 2007; 14: 224-32.
6. Rawla P, Sunkara T, Gaduputi V. Epidemiology of pancreatic can-

cer: global trends, etiology and risk factors . World J Oncol. 2019; 10:10-27.

7. Wolfgang CL, Herman JM, Laheru DA, Klein AP, Erdek MA, Fishman EK, Hruban RH. Recent progress in pancreatic cancer. CA Cancer J Clin. 2013; 63:318-348.
8. Costa Santos M, Cunha C, Velho S. et al. Preoperative biliary drainage in patients performing pancreaticoduodenectomy : guidelines and real-life practice. Acta Gastroenterol Belg. 2019; 82(3): 389-95.
9. Whipple AO. Pancreaticoduodenectomy for islet carcinoma: a five-year follow-up. Ann Surg. 1945; 121: 847-52.
10. Charles J, Yeo M, John L, Cameron MD. Pancreaticoduodenectomy with or without extended retroperitoneal lymphadenectomy for periampullary adenocarcinoma comparison of morbidity and mortality and short-term outcome. Ann Surg. 1999; 229(5): 613-24.
11. Carlos Fernandez-del Castillo M, Vicente M-O. Evolution of the Whipple procedure at the Massachusetts General Hospital. Surgery. 2012; 152: 56-63.
12. Walter J. Palliative partial pancreaticoduodenectomy impairs quality of life compared to bypass surgery in patients with advanced adenocarcinoma of the pancreatic head. EJSO. 2011; 37: 798-804.
13. Yeo CJ, Cameron JL, Lillemoe KD, et al. Pancreatoduodenectomy for cancer of the head of the pancreas: 201 patients. Ann Surg. 1995; 221: 721-33.
14. Shabbar H. Changazi , Qamar Ahmed , Samiullah Bhatti. Whipple Procedure: A Five-Year Clinical Experience in Tertiary Care Center. Cureus. 12(11): e11466.
15. Saraee A, Vahedian-Ardakani J, Saraee E, Pakzad R, Wadji MB. Whipple procedure: a review of a 7-year clinical experience in a referral center for hepatobiliary and pancreas diseases. World J Surg Oncol. 2015; 13: 98.
16. Halloran CM, Ghaneh P, Bosonnet L, Hartley MN, Sutton R, Neoptolemos JP. Complications of pancreatic cancer resection. Dig Surg. 2002; 19: 138-46.
17. Matsumoto Y, Fujii H, Miura K, et al. Successful pancreatojejunual anastomosis for pancreatoduodenectomy. Surg Gynecol Obstet. 1992; 175: 555-62.
18. Romano G, Agrusa A, Galia M, et al. Whipple's pancreaticoduodenectomy: surgical technique and perioperative clinical outcomes in a single center. Int J Surg. 2015; 21: 68-71.
19. Jemal A, Siegel R, Ward E, Hao Y, Xu J, Murray T, et al. Cancer statistics 2008. CA Cancer J Clin. 2008; 58: 71-96.
20. Li D, Xie K, Wolff R, Abbruzzese JL. Pancreatic cancer. Lancet. 2004; 363: 1049.
21. Shi C, Hruban RH, Klein AP. Familial pancreatic cancer. Arch Pathol Lab Med. 2009; 133: 365-74.
22. Hruban RHMA, Hruban RH, Maitra A, Goggins M. Update on pancreatic intraepithelial neoplasia. Int J Clin Exp Pathol. 2008; 1: 306-16.
23. Chu GC, Kimmelman A, Hezel AF, DePinho RA. Stromal biology of pancreatic cancer. J Cell Biochem. 2007; 101: 887-907.