

Histopathological Analysis of Whipple Resection Specimens in a Local Population

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ABSTRACT

Objective: Our aim was to study the and histopathological findings and distribution of these tumors and to observe local trends of periampullary neoplasms in Whipple resection specimens.

Study Design: A descriptive study

Place and Duration of Study: This study was conducted at the Department of Pathology University College of Medicine and Dentistry, University of Lahore from June 2023 to December 2023.

Methods: Whipple samples received in histopathology department because of different clinical presentations were included in the study. The histological preparation was performed by classical method for inclusion in paraffin followed by hematoxylin–eosin staining.

Results: Thirty patients underwent Whipple's Pancreatoduodenectomy procedure during a period of 6 months from June 2023 to December 2023. Out of these thirty Whipple specimens, malignancy was found in 29 patients (96.67%) and 1 (3.33%) case was diagnosed as benign. Periampullary Adenocarcinoma was the most common tumor (36.66%) than Duodenal Adenocarcinoma (23.33%), followed by Pancreatic Adenocarcinoma (20%) and distal CBD Cholangiocarcinoma (13.33%). Two of the cases (6.66%) were diagnosed Neuroendocrine tumor on biopsy which were clinically established as a pancreatic malignancy. Tumor size was not significantly different in all these tumors. Four out of six pancreatic adenocarcinomas displayed lymphovascular and perineural invasion. Surgical margin was clear in majority of the cases excluding one case of pancreatic adenocarcinoma and two cases of periampullary duodenal carcinoma.

Conclusion: A detailed histopathological examination should be done in all Whipple resection specimens. Pathologists should also be conscious of possibility of a benign diagnosis in PD specimens which have been resected assuming malignancy based on clinico- radiological findings.

Key Words: pancreatoduodenectomy, whipple, neuroendocrine, pathologic stage.

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INTRODUCTION

The very first successful resection of the duodenum and part of pancreas (pancreatoduodenectomy) was carried out by Kausch which was later promoted by Whipple and now is known by his name.^{1,2} the morbidity and mortality related with this extensive surgery has been greatly minimized with the current advances in Advances in surgical technique,

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perioperative care.^{3,4} a modified technique known as called pylorus preserving pancreato-duodenectomy is related with minimal complications. These days Whipple's procedure has been significantly utilized as a protected and suitable resection choice for tumors of the periampullary region which are pancreatic, ampullary, biliary and duodenal tumors.^{1,5} The recurrence of worked ampullary, pancreatic, biliary and duodenal malignancies is variable in various examinations which influences patient endurance. A current large review done by a researcher on 521 periampullary tumors uncovered ampullary carcinomas to be the most well-known reason for pancreatoduodenectomy while some other writing shows pancreatic disease on lead. ^{6,7} to precisely evaluate different prognostic variables ; a careful Pathologic assessment of careful examples from PD ought to be finished. These variables are cancer size, area, expansion, status of careful edge, vascular or perineural intrusion and lymph hub status.⁸⁻¹⁰The aim of this study was to identify the distribution and histopathologic features of ampullary, pancreatic,

duodenal and biliary malignancies in PD resections done in a tertiary level hospital.

METHODS

A descriptive study was carried out in the Department of Pathology University College of Medicine and Dentistry, University of Lahore during the time period of June 2023 to December 2023.

Whipple samples received in histopathology department because of different clinical presentations were included in the study. The histological preparation was performed by classical method for inclusion in paraffin followed by hematoxylin–eosin staining. All the data was recorded on the Performa. Tumor site, histopathologic subtype, grade, lymphovascular and perineural invasion, lymph node and margin status were examined. TNM staging of the tumor was done according to AJCC TNM classification.¹¹ Related clinical parameters and radiological findings were found out where needed.

RESULTS

Out of Thirty patients who underwent Whipple's procedure during a period of 6 months. eighteen (60%) patients were male and 12 (40%) were female. The mean age of the patient was 56.5 years (range: 38 to 75 years). Ten patients (33.34%) were in 66-75 years age group (Table 1). Majority of the patients had history of obstructive jaundice.

Out of these Thirty Whipple specimens, malignancy was found in 29 patients (96.67%) and 1 (3.33%) case was diagnosed as benign. Periapillary adeno carcinoma was the most common tumor (36.66%, figure 1) then duodenal adenocarcinoma (23.33%), followed by pancreatic adenocarcinoma (20%, figure 2) and distal CBD cholangiocarcinoma (13.33%). Two of the cases (6.66%) were diagnosed Neuroendocrine tumor (figure 3) on biopsy which were clinically established as a pancreatic malignancy. (Table 2).

Table No. 1: Frequency Distribution of Different Variables

Gender	Frequency	Percentage
Male	18	60
Female	12	40
Total	30	100.0
Age Groups		
35-45	4	13.34
46-55	8	26.66
56-65	10	33.34
66-75	6	20
76-85	2	6.66
Total	30	100.0

Table No. 2: Histopathological Diagnosis of Whipple Specimen.

Sr. No.	Histopathological diagnosis	n total 30 (100%)
1.	Malignant lesions (96.67%)	29
a.	Pancreatic Adenocarcinoma	6 (20%)
b.	Duodenal Adenocarcinoma	7 (23.33%)
c.	Periapillary Carcinoma	11 (36.66%)
d.	Common Bile Duct Cholangiocarcinoma	4 (13.33%)
e.	Neuroendocrine tumors	2 (6.66%)
2	Others (Benign)	1 (3.33%)

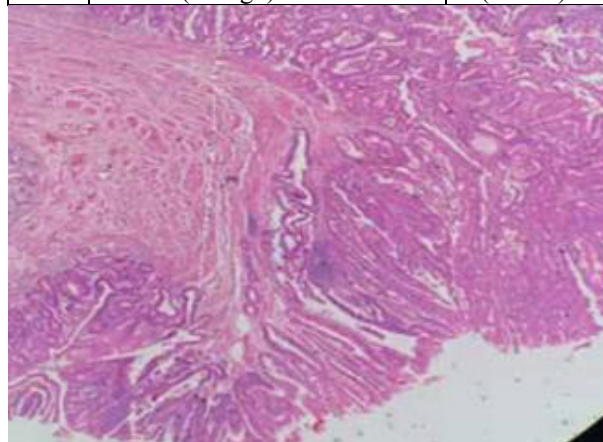


Figure No. 1. Periapillary Adeno Carcinoma 40x H&E.

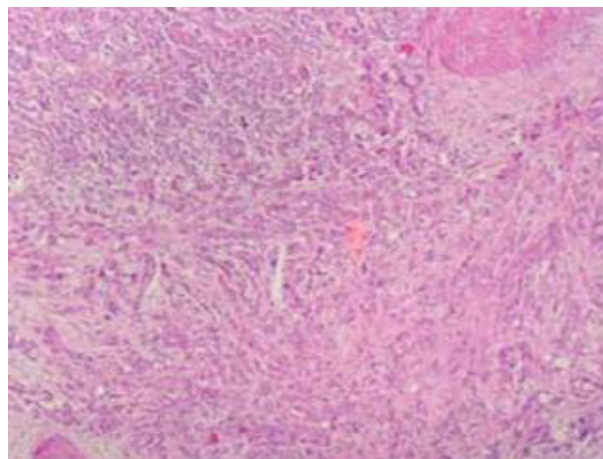


Figure No. 2. Pancreatic Adenocarcinoma 100x H&E.

Detailed histologic examination about Tumor site, histopathologic subtype, tumor grade, all out number of lymph hubs took apart, status of lymph hub, lymphovascular and perineural attack, careful edge was finished. The majority of the periapillary adenocarcinoma, pancreatic and duodena l, and distal

cholangiocarcinomas were decently separated though ampullary carcinomas were transcendently very much separated (80%). Tumor size was not fundamentally disparate in this large number of tumors. Notwithstanding, Lymphovascular and perineural intrusion contrasted among these different tumor types. Four out of six pancreatic adenocarcinomas showed lymphovascular and perineural attack. On normal twelve lymph hubs were taken apart. Careful edge was clear in larger part of the cases barring one instance of pancreatic adenocarcinoma and two instances of periampullary duodenal carcinoma.

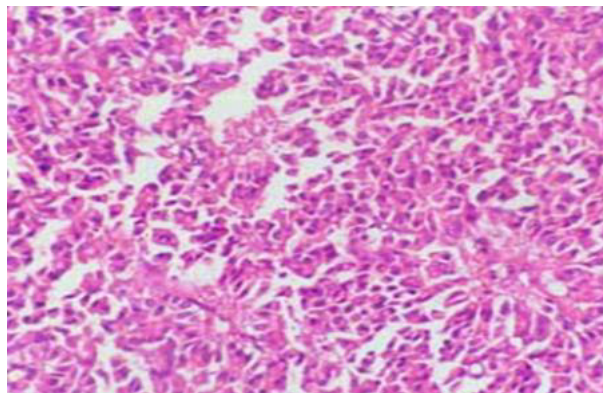


Figure No. 3: Neuroendocrine Tumor 400x H&E.

Table No. 3: Pathologic Staging of the Malignant Tumors

pT	n (%)
T1	5 (17.24%)
T2	14 (48.28%)
T3	9 (31.03%)
T4	1 (3.44%)

DISCUSSION

Since Whipples procedure is one of the complex surgeries done for chronic pancreatitis patients who are not responsive to medical therapy and also for malignancies at these sites. Though it is the life saving procedure but still the long term survival is chiefly dependent on the pathology within the resected specimen which stresses the need of thorough examination of PD specimens.¹¹ Therefore, we very carefully reported all these cases following the latest CAP protocols.¹² In our study periampullary carcinoma was the most prevalent malignancy among (36.67%) Whipple PD specimen which is different to other studies.¹³ This discrimination could be due to our strict adherence to the diagnostic criteria as proposed by a researcher for the diagnosis of Ampullary carcinoma.¹⁴ pancreatic adenocarcinoma is the commonest finding in PD samples according to Western studies. In a review of 650 pancreatoduodenectomies found 43% cases to be pancreatic adenocarcinoma.¹ We found only six cases of pancreatic adenocarcinoma and two case of Pancreatic neuroendocrine tumor which is lesser comp

in contrast to these studies. This may however may not be true depiction because of the small number of our cases so should be interpreted with caution. A longer study with larger sample size may truly clarify this incidence in our country. Histologically periampullary / ampullary carcinoma can be of pancreaticobiliary type, intestinal, mixed and undifferentiated type. This typing is of prognostic significance with the intestinal type associated with good prognosis.¹⁵

As there is a lot of proof in literature about unfortunate guess is connected with tumor size multiple cm, positive resection edge, lymph hub metastasis and inadequately separated tumor. In our review resection edge was positive in one instance of pancreatic adenocarcinoma and two instances of periampullary duodenal carcinoma. Four out of six pancreatic adenocarcinomas showed lymphovascular and perineural intrusion. While noticing lymph hub status, 15 cases (51.8%) showed lymph hub metastasis which is meaningly higher rather than study done by Ibrahim et al (10%).² In addition ten cases were diagnosed to be in cutting edge stages (T3 or higher). This shows a considerable lot of our patients are diagnosed in cutting edge stages with far and wide lymph hub metastasis.¹⁶ One of the cases emerged to be harmless on histopathology rather than thought danger clinically. This case showed extreme fibrosis prompting harmless injury development and vague aggravation. Literature likewise upholds this finding that harmless histology could be pretty much as high as 13%.⁷ In a report from Mayo Center, likewise different studies uncovered 5% and some other 6% of cases showing harmless sickness in Whipple resection tests. Thus, these discoveries deduce that at least 5% of harmless illness is guessed while executing PD for a thought threat.

CONCLUSION

A thorough, careful histopathologic examination is needed for pancreatoduodenectomy samples in order to properly categorize tumor and other prognostic factors. Possibility of a benign diagnosis remains in PD specimen which have been resected presuming malignancy based on clinical judgement and radiological data.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Anam Ilyas, Sobia Anwar, Sadaf Ali Jaffari, Sadia Sharif
Drafting or Revising Critically:	Asma Rasheed, Lubna Humayun
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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