

Clinicopathological Study of Whipple's Pancreaticoduodenectomy Specimens: A 2-Year Study in a Tertiary Care Cancer Centre

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Abstract

Background: Whipple's Pancreaticoduodenectomy (WPD) is done for a myriad of tumours as well as inflammatory conditions affecting the duodenum, CBD, ampulla of Vater, and head of pancreas. This study aims to analyze the demographic distribution and histomorphological variations of WPD specimens and to evaluate the prognostic significance of these parameters.

Methods: This is a prospective study of 35 WPD specimens received in our department. Details were collected, and gross and microscopic features were analysed and recorded. Slides were reviewed, and the parameters were calculated.

Results: Out of 35 patients, 28 cases (80%) were malignant, 2 cases (5.7%) were tumors with low malignant potential, and 5 cases (14.2%) were benign. The M:F was 1.18:1. The mean age of the patients was 54.7 years. Periapillary carcinomas were the predominant malignant tumors (22.8%), followed by ampullary carcinomas (17.14%). Well-differentiated adenocarcinoma was the most common histology. Most of the tumors were stage T3. Out of 28 malignant tumors, 11 cases had LVI, 11 cases had PNI, and 12 cases showed lymph node metastasis. Only one case had a positive resection margin.

Conclusion: Our study emphasizes the importance of tumour grade, tumour stage, presence of LVI, PNI, positive margins, and lymph node metastasis as strong prognostic factors for patient survival. This is well corroborated by the significant p-value in our study. Most of our cases were diagnosed at a locally advanced stage. Hence, a more precise assessment and clinical evaluation can lead to early detection of cancer, improving survival rates.

Keywords: Pancreaticoduodenectomy; Whipple's Pancreaticoduodenectomy; Periapillary Tumour; Histomorphological Variation.

Introduction

Dr. William Halsted performed the first successful local resection of a periampullary tumour in the year 1898 [1]. In 1909, Kaush performed regional resection of the duodenum and a part of the pancreas (pancreaticoduodenectomy) for the periampullary tumour and subsequently reported it in 1912 [2]. The procedure was further modified by Allen Oldfather Whipple in 1935 by complete removal of the head of the pancreas and the whole of the duodenum [3]. In the year 1937, the indications for pancreaticoduodenectomies were further extended by Brunschwig to include pancreatic carcinomas [4].

Whipple's Pancreaticoduodenectomy (WPD) procedure is done for a myriad of tumours as well as inflammatory conditions affecting the duodenum, common bile duct, ampulla of Vater, and the head of pancreas [5]. These are performed for resectable periampullary cancers, which are pancreatic, ampullary, biliary, and duodenal cancers [6].

There are two common types of Whipple procedures: the conventional Whipple and the pylorus-sparing Whipple procedure. The conventional Whipple involves removal of the portion of the stomach, head of the pancreas, the duodenum, as well as the gallbladder and a portion of the bile duct. In a pylorus-sparing Whipple, the section of stomach is not removed during

the operation [7]. Owing to the intricate arrangement of the organs in this area, occasionally even a benign lesion such as chronic fibrosing pancreatitis, paraduodenal pancreatitis, and chronic pancreatitis can produce obstructive symptoms mimicking malignancy [8].

Ampullary and periampullary carcinomas constitute about 5% of gastrointestinal malignancies, out of which 80% are adenocarcinomas [9]. Most of the tumour located in the ampullary region which bulges into the duodenal mucosa are considered as ampullary carcinoma, and if the tumour is involving the circumference of the ampulla, then it is considered as periampullary carcinoma. Pathologic assessment of surgical Whipple specimens needs special attention in order to accurately evaluate the many prognostic factors which include tumor location, extension, size, surgical margins status, vascular or perineural invasion, and lymph node status [10].

To study the demographic distribution and histomorphological variations of WPD specimens in regard to tumour site, size, type, grade, marginal status, nodal metastasis, PNI, and LVI and to analyse the prognostic significance of all these parameters in order to correlate the overall spectrum of these cases.

Materials and Methods

A prospective study was carried out in the Department of Oncopathology, State Cancer Institute, Gauhati Medical College and Hospital for a period of 2 years from Nov 2022 to Oct 2024.

Study design - Hospital-based prospective study.

Duration of study - The study has been conducted for a period of 2 years from Nov 2022 to Oct 2024.

Sample size - Calculated according to the standard statistical formula.

Inclusion criteria - The study included all operated cases of Whipple's Pancreaticoduodenectomy procedure. Details of all the cases which had undergone Whipple's resection were retrieved. 35 cases (including malignant and benign) were analysed in regard to age and sex distribution, tumor size, site, gross examination and microscopic findings, tumor extension, resection margins, lymph node status, LVI, PNI, tumor grading, and staging.

Exclusion criteria - Specimens with prior history of neoadjuvant treatment. Whipple's resection cases received for slide review without gross specimens were excluded from the study. Autolysed specimen.

Statistical Analysis: Using SPSS version 22, Chi-square test was done for data analysis and a p-value was calculated. A p-value of < 0.05 was considered significant.

Grossing Protocols In Regard To Tumor Location: Ampullary tumours encompass the tumours located in the most distal intraduodenal portion of the common bile duct (CBD) and main pancreatic duct (MPD) as well as those located in the small protuberance of the duodenum (papilla of Vater) where the duct epithelium transitions into duodenal mucosa supported by a muscle bundle (sphincter of Oddi) [11]. Carcinomas arising in the mucosa of the confluence of the pancreatic and CBD or in the epithelium covering the papilla of Vater were taken as ampullary carcinomas [12]. Periampullary tumours are a heterogenous group of neoplasms arising from the pancreatic head, distal CBD, and the duodenum. Hence, periampullary tumours were taken as tumours located at the circumference of the ampulla [13].

Adenocarcinoma grading was done based on the percentage of glands seen in the tumour tissue. Well-differentiated: Presence of $> 95\%$ glands, Moderately differentiated: Presence of 50% to 95% glands, Poorly differentiated: Presence of 5% to 49% glands, Undifferentiated: Presence of $< 5\%$ glands. TNM Staging was done as per 8th Edition AJCC Cancer Staging Manual.

Results

A total number of 35 patients who underwent WPD during a period of 2 years from Nov 2022 to Oct 2024 were enrolled during the study. The age of the patients varied from 23 to 76 years with a peak incidence in the 6th decade (Table 1).

19 (54%) patients were male and 16 (46%) were female (Figure 1). The male:female, M:F ratio is 1.18:1. The mean age of the patient was 54.7 years. Abdominal pain was the most common clinical complaint (Figure 2).

28 (80%) comprised of malignant tumors, 2 (5.7%) showed tumors with low malignant potential, and 5 (14.2%) were of benign nature (Table 2, Figure 3).

Periampullary carcinomas were the predominant malignant tumors (8 cases, 22.8%), followed by Ampullary carcinomas (6 cases, 17.14%), Cholangiocarcinoma (5 cases, 14.2%), Pancreatic Adenocarcinoma (3 cases, 8.57%), and Solid pseudopapillary neoplasm (1 case, 2.58%). Pancreatic Neuroendocrine tumors constituted (4 cases, 11.4%), and Pancreatic Lymphoma (1 case, 2.58%). Tumors with low malignant potential were constituted by Intra-ampullary papillary tubular neoplasm (1

case, 2.58%) and Intraductal papillary mucinous neoplasm of the pancreas (1 case, 2.58%). Single cases each of Serous Cystadenoma (2.58%) and Brunner's gland hyperplasia (2.58%) and 3 cases of Chronic pancreatitis (8.57%) were seen, which were operated owing to the obstructive symptoms mimicking malignancy.

When we distributed the cases age-wise with respect to histopathological diagnosis, the p-value was found to be statistically significant ($p = 0.0317$) (Table 3). The mean tumor size of Ampullary and Periampullary Carcinoma in our study was 2.7 cm and 2.4 cm respectively (Table 4).

Out of 13 well-differentiated tumors, 10 were of intestinal type and 3 were of pancreatobiliary type. Out of 8 moderately differentiated tumors, 7 were of pancreatobiliary type and 1 was of intestinal type. There was only 1 case of poorly differentiated type which was again of pancreatobiliary type. When we compared the tumor type with tumor grading, a significant p-value was obtained (0.0097). Thus we can conclude that, in our study with increasing grade and decreasing differentiation, the prognosis also worsened as pancreatobiliary has a worse prognosis compared to the intestinal type of adenocarcinomas (Table 5, Figure 4).

Of the 6 Ampullary carcinomas, 5 (83.3%) cases had LVI, 1 case (16.6%) had PNI, and 1 case (16.6%) showed metastatic deposits in the lymph node. Among the 8 Periampullary carcinomas, 2 (25%) cases showed LVI, 7 (87.5%) cases had PNI, and 6 (75%) cases showed tumor deposits in the lymph nodes. Among the 3 Pancreatic Adenocarcinomas, all cases showed LVI, 2 (66.6%) cases had PNI, and all cases showed tumor deposits in the lymph nodes. Among the 5 Cholangiocarcinomas, 1 case (20%) showed LVI, 1 case (20%) had PNI, and 2 (40%) cases showed tumor deposits in the lymph nodes. Distribution of LVI, PNI, and lymph node metastasis using Chi-square test is depicted in Table 6 showing a significant p-value. Only one case of Ampullary carcinoma showed an involved resection margin (SMA margin).

There were 4 cases of Pancreatic Neuroendocrine tumor located in the head of the pancreas; the mean size of the tumor was 4.17 cm. The mean age of the patient was 56.25 yrs. All were well-differentiated type and of low to intermediate grade. The tumors were non-functional and did not show LVI, PNI, or lymph node metastasis.

There was 1 case of lymphoma (non-Hodgkin's) which occurred in a 34 yrs old female patient. There was 1 case of Solid pseudopapillary neoplasm of the pancreatic head which occurred in a 23 years old female. The size of the tumor was 7.8 cm. LVI, PNI, and lymph node metastasis were characteristically absent in both the cases.

We came across a single case of Intraductal papillary mucinous neoplasm (IPMN) of the pancreas in a 41-year-old female, having a maximum tumor dimension of 7 cm. Also, a single case of Intra-ampullary papillary tubular neoplasm was found in a 65 yrs old male with a tumor size of 1.2 cm. LVI, PNI, and lymph node metastasis were characteristically absent in both the cases.

There were 3 cases of Chronic pancreatitis and 1 case of Brunner's gland hyperplasia. All these cases presented with symptoms and radiology mimicking malignancy. There was one case of Serous Cystadenoma occurring in the head of pancreas with the lesion measuring 12 cm in size.

Table 1: Distribution of cases of Whipple's Pancreaticoduodenectomy with respect to age.

Age range	Total	Percentage
21-30	1	2.85%
31-40	3	8.57%
41-50	9	25.7%
51-60	15	42.85%
61-70	6	17.1%
71-80	1	2.85%
Total (N=35)	35	100%

Discussion

WPD is performed as a life-saving procedure for a variety of tumours. Surgery is the cornerstone of treatment with chemotherapy playing a supportive role. On estimation, the five-year survival rate of cases undergoing Whipple's resection was 10% to 25%. Ampullary adenocarcinoma constitutes about 0.2% of all the gastrointestinal tumours [14]. In the United States, periampullary adenocarcinomas account for more than 30,000 cancer-related deaths per year, ranking these tumours as the fifth leading cause of cancer deaths in the country [15]. Pancreatic malignancy is the fourth most common fatal malignancy in the United States [16] and sixth in Europe. In India, pancreas ranks 24th with 10,860 new cases (1.03%) and 18th in mortality [17].

The age of the patients in our study varied from 23 to 76 years, which was consistent with a study done by Jigar Shah et al.

Table 2: Distribution of cases with respect to histopathological diagnosis.

Category	Diagnosis	No of Cases	Percentage (N=35)
Benign	Chronic Pancreatitis	3	14.2%
	Serous Cystadenoma	1	
	Brunner's gland hyperplasia	1	
Low Malignant Potential	Intra-ampullary papillary tubular neoplasm	1	5.7%
	Intraductal papillary mucinous neoplasm	1	
Malignant	Ampullary Carcinoma	6	80%
	Periampullary Carcinoma	8	
	Cholangiocarcinoma	5	
	Pancreatic Adenocarcinoma	3	
	Solid Pseudopapillary Neoplasm	1	
	Pancreatic Neuroendocrine tumor	4	
	Lymphoma	1	

Table 3: Age-wise distribution of cases with respect to diagnostic category ($p = 0.0317$).

Category	21-30	31-40	41-50	51-60	61-70	71-80	Total
Ampullary Carcinoma	0	1	1	1	2	1	6
Periampullary Carcinoma	0	1	2	4	1	0	8
Pancreatic Adenocarcinoma	0	0	0	2	1	0	3
Pancreatic Neuroendocrine tumor	0	0	1	2	1	0	4
Lymphoma	0	1	0	0	0	0	1
Intra-ampullary papillary tubular neoplasm	0	0	0	0	1	0	1
Intraductal papillary mucinous neoplasm	0	0	1	0	0	0	1
Solid Pseudopapillary Neoplasm	1	0	0	0	0	0	1
Cholangiocarcinoma	0	0	1	4	0	0	5

Table 4: Size and site distribution of tumor.

Category	1 cm to <2cm	>2cm to <3cm	>3cm to <4cm	>4cm
Ampullary Carcinoma	2	2	2	0
Periampullary Carcinoma	5	2	0	1
Pancreatic Adenocarcinoma	1	1	1	0
Cholangiocarcinoma	3	1	1	0
Total (N=22)	11	6	4	1

Table 5: Grading of tumors according to location, type and pathological T stage at presentation.

Category	Sub-Category	Well Diff.	Mod. Diff.	Poorly Diff.	p-value
Location of Adenocarcinoma	Ampulla	5	1	0	0.143
	Periampulla	6	1	1	
	Pancreas	1	2	0	
	Distal CBD	1	4	0	
Type	Pancreaticobiliary	3	7	1	0.0097
	Intestinal	10	1	0	
Staging	T1	1	1	0	0.878
	T2	5	2	0	
	T3	7	5	1	

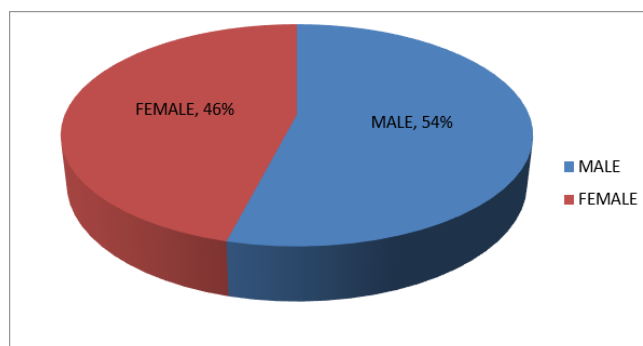
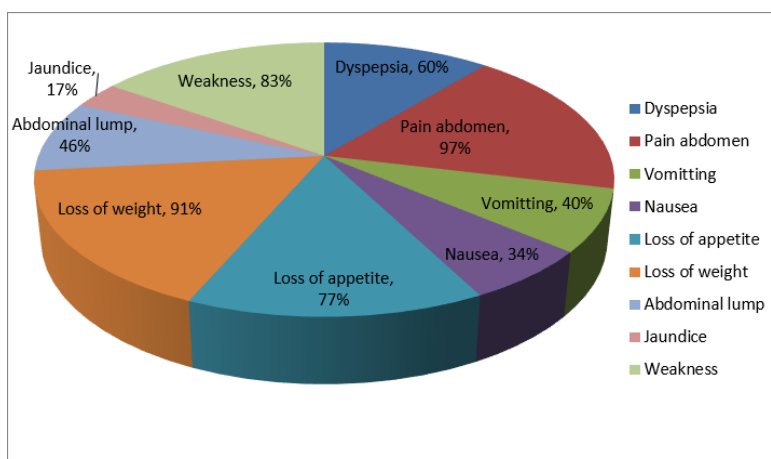
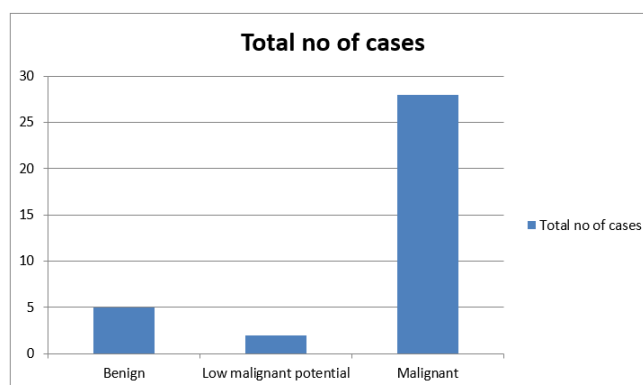
[18] in 2023. In our study, 19 (54%) patients were males and 16 (46%) were females. The male:female, M:F ratio is 1.18:1. It was consistent with a study done by Shovana Karki et al. [19] where the M:F ratio was 1.2:1. Other studies done by Jigar Shah et al. [18], Imam et al. [10], Ashima Nagesh Amin et al. [5], Yash Saxena et al. [7], and Kokandakar H R et al. [20] also showed male predominance.

The peak incidence in our study was in the 6th decade with a mean age of 54.7 years. It was similar to studies done by Jigar

Table 6: Comparison of Adenocarcinoma cases with respect to LVI, PNI and Lymph node metastasis.

Type of tumor	LVI +	LVI -	p-value	Type of tumor	PNI +	PNI -	p-value
Ampullary carcinoma	5	1	0.030	Ampullary carcinoma	1	5	0.008
Periampullary carcinoma	2	6		Periampullary carcinoma	7	1	

Type of tumor	LN +	LN -	p-value
Ampullary carcinoma	1	5	0.030
Periampullary carcinoma	6	2	

**Figure 1:** Sex Distribution Of Whipple's Pancreaticoduodenectomy.**Figure 2:** Presenting Clinical Complaints.**Figure 3:** Distribution of cases into subcategories.

Shah et al. [18], Ashima Nagesh Amin et al. [5], Yash Saxena et al. [7], Shovana Karki et al. [19], Foroughi F. et al. [21], Salwa O. Mekki et al. [22], and Saree et al. [23].

Ashima Nagesh Amin et al. [5], Foroughi F. et al. [21], and Saree et al. [23] found that the most common presenting

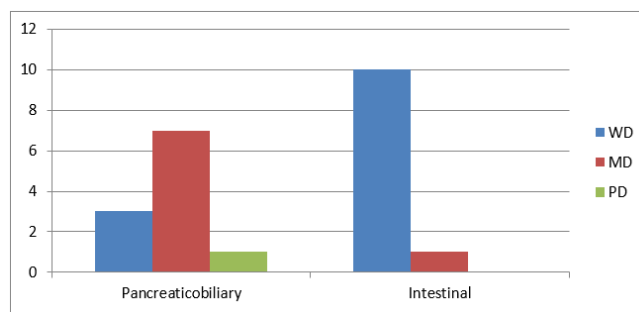


Figure 4: Distribution of type of Adenocarcinoma with respect to tumor differentiation.

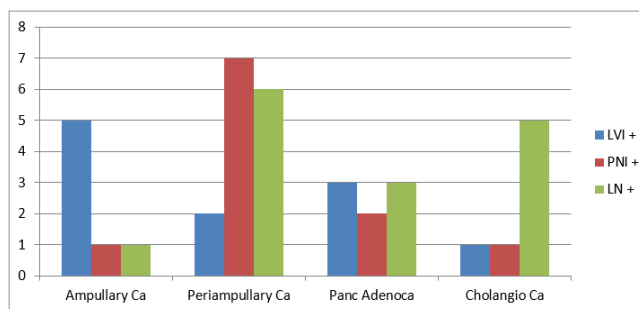


Figure 5: Distribution of type of Adenocarcinoma with respect to LVI, PNI and LN metastasis cases.

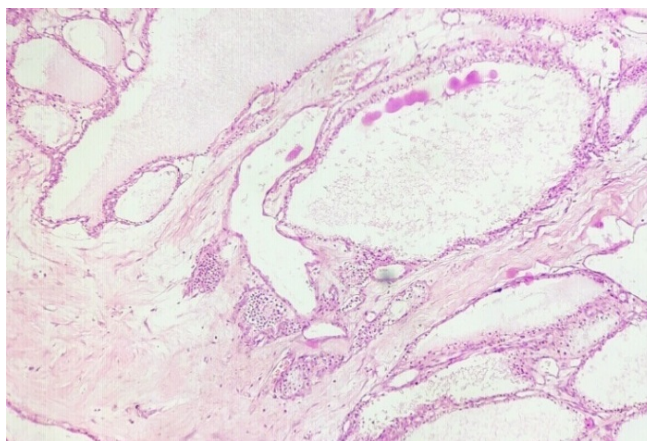


Figure 6: Serous Cystadenoma.

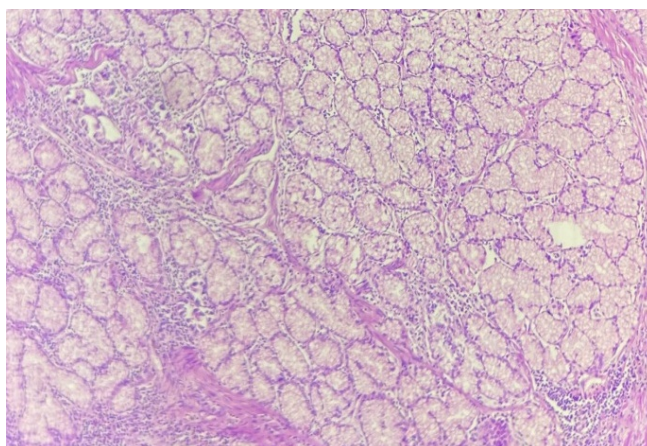


Figure 7: Brunner's gland hyperplasia.

symptom was jaundice followed by pain abdomen. This was not consistent with our study as abdominal pain was the most common clinical complaint.

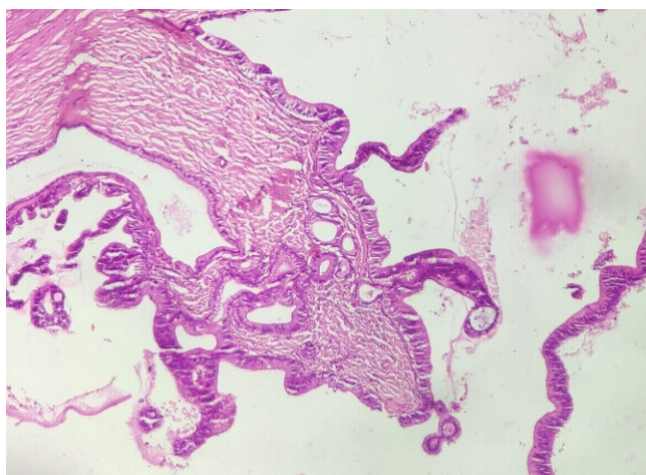


Figure 8: Intraductal papillary mucinous neoplasm.

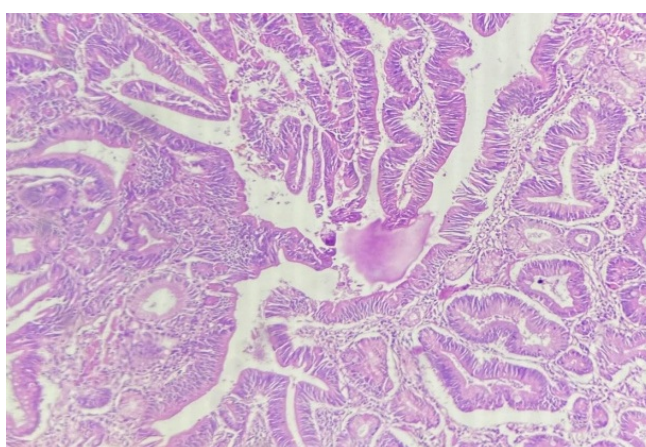


Figure 9: Intra-ampullary papillary tubular neoplasm.

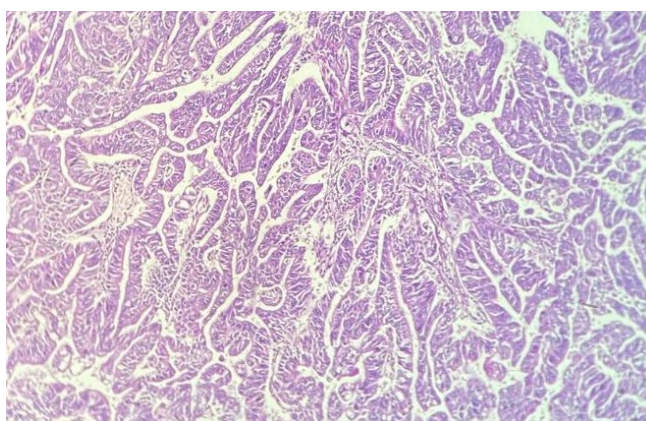


Figure 10: WD Adenocarcinoma.

In our study, benign lesions constituted 14.2%, low malignant potential lesions constituted 5.8%, and malignant lesions constituted 80% of cases. Foroughi F et al. [21] in their study observed that 13.7% of cases had benign lesions. Margijske et al. reported 15% lesions as benign in their study. 650 Whipple's specimens analysed by Yeo CJ et al. [2] revealed 32% as benign, 5% as neuroendocrine tumours, 4% as pancreatic cystadenoma, 2% as GIST, and 67% as malignant lesions.

The periampullary region was the most commonly involved tumor site in our study. It was consistent with studies done by Jigar Shah et al. [18], Imam et al. [10], Ashima Nagesh Amin et al. [5], Seema Chaddha et al. [24], Yash Saxena et al. [7], Jakhmola CK et al. [25], and Kokandakar H R et al. [20]. Other studies revealed ampullary carcinomas or pancreatic adenocarcinomas as the most common type. These differences may be due to variations in geographical demography and study sample size. An extensive study of a larger sample size would reveal the pancreatic carcinoma incidence in the Indian subcontinent. Moreover, not all pancreatic tumours undergo pancreaticoduodenectomy resection [26].

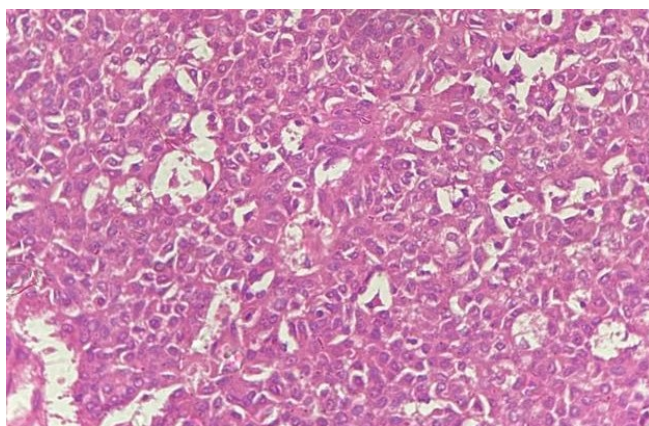


Figure 11: Neuroendocrine Tumor.

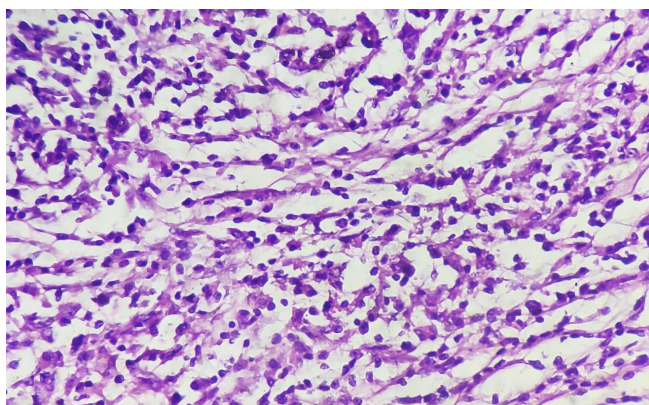


Figure 12: Lymphoma.

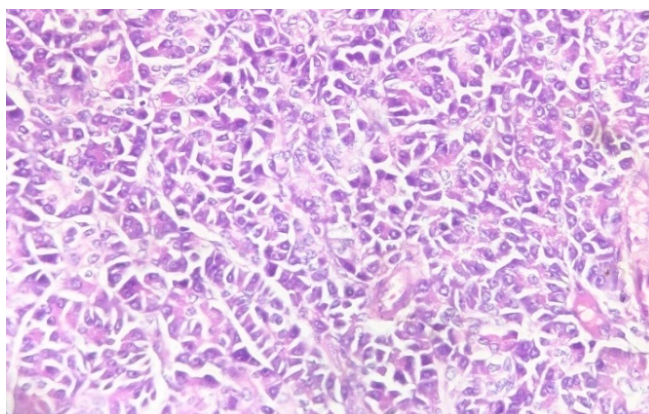


Figure 13: Solid Pseudopapillary Neoplasm.

In our study, the most common histology was well-differentiated adenocarcinoma which was consistent with a study done by Suneetha S et al. [22] and Ashima Nagesh Amin et al. [5]. In a five-year study conducted in India, well-differentiated adenocarcinomas were the commonest subtypes of tumors of the pancreas (57.1%) and ampulla (87.5%). Histopathologic grade is associated with prognostic significance. High-grade carcinomas have a relatively less favorable prognosis [27]. We had only 1 case of poorly differentiated adenocarcinoma which was significantly associated with a higher T stage and perineural invasion in our study.

Pancreatic tumours are predominantly seen in males in their seventh decade [17]. In our study also, pancreatic cancer was found mostly in the 7th decade with male predominance.

When we distributed the cases age-wise with respect to histopathological diagnosis, a significant p-value ($p = 0.0317$) was obtained. There were 5 cases of Distal Common Bile Duct Carcinoma in our study with a peak incidence in the 6th decade. 4 out of 5 cases were moderately differentiated and 1 case was well-differentiated. In contrast, Salwa O. Mekki et al. [22] reported 4 cases of Distal Common Bile Duct Carcinoma in their studies, all of moderately differentiated histology. Yash Saxena et al. [7] reported 3 cases of Distal Common Bile Duct Carcinoma in their study, among which 2 cases were

moderately differentiated and 1 case was well-differentiated.

When we distributed the tumor according to tumor grade and tumor type, a significant p-value (0.0097) was obtained. Perineural invasion (PNI), lymphovascular invasion (LVI), locoregional lymph node metastasis, pathologic stage of the tumor, and microscopic assessment of margins are important predictive factors for risk of recurrence and important prognostic factors. LVI or PNI is indicative of the risk of regional tumor spread along with metastasis to regional lymph nodes [27]. The number of lymph nodes dissected and involved by tumor is one of the most important prognostic factors in pancreatic and ampullary carcinomas, and this also contributes to more accurate pathologic staging and predicting survival outcomes [28]. In the present study, lymph node positivity was seen in all cases of pancreatic tumours. Yeo CJ *et al.*, in his study, reported 61% pancreatic adenocarcinomas of which 72% had nodal involvement [2]. Ashima Nagesh Amin *et al.* [5] reported that maximum lymph node positivity was seen in pancreatic tumours (7/13). Several study series have reported similar findings of a higher incidence of lymph node involvement in pancreatic cancers in comparison to cancers of the ampullary and periampullary region [5]. When we correlated different Adenocarcinoma cases with respect to LVI, PNI, and lymph node metastasis, the p-value was found to be statistically significant.

While margin positivity appears to be critically important, not all margins may have a similar impact on patient survival. Delperio *et al.* reported that a positive SMA or SMV margin had a significant impact on progression-free survival; a positive posterior margin had no impact. A study conducted by Yeo JC *et al.* on 201 patients stated the five-year survival in margin-negative cases as 26% (median survival 18 months) compared to cases with margin positivity 8% (median survival 10 months) [2]. In our study, only 1 case had a positive SMA margin.

Most patients were diagnosed in a late stage (T3, 59%) in our study, followed by a locally advanced pathological stage (T2, 31.8%) and very few in early stages (T1, 9.09%). It was consistent with studies done by Foroughi F *et al.* [21], Salwa O. Mekki *et al.* [22], and Kokandakar H R *et al.* [20]. This finding highlights that a more precise assessment and clinical evaluation can lead to early cancer detection.

The incidence of pancreatic endocrine neoplasm is less than 3% of all pancreatic neoplasms according to Henson *et al.* [28]. In our study, 11.4% were pancreatic neuroendocrine tumour (NET), which was consistent with Jigar Shah *et al.* [18]. It is an indolent tumour having a comparatively better prognosis than pancreatic adenocarcinomas [26]. We got 4 cases of pancreatic NET, presenting equally in both males and females, with a mean age of 56.25 years.

Solid pseudopapillary neoplasm is a tumour of young females. It is a cystic and solid neoplasm involving the head and tail of the pancreas. Histopathologically, this tumor is composed of small round cells crowding around the blood vessels. The extensive necrosis of the cells that are away from the blood vessels gives it a pseudopapillary appearance. This tumor expresses beta-catenin, Vimentin, CD10, and CD56. Our study reported 1 case of a 23-year-old female. A study by Patil TB *et al.* states the mean age as 20 years [26].

WPD may also be employed in patients with chronic pancreatitis when pain cannot be controlled by other means and when the disease is maximal in the head of the pancreas [5]. It has been reported that in many complicated cases of chronic pancreatitis, presenting as a periampullary mass, the Whipple's procedure is now considered reasonable. Smith *et al.* and VanGulik *et al.* suggested that at least 5% of benign findings is expected when performing PD for a suspected malignant case [18]. In the present study, there were 3 cases where WPD was done on clinical suspicion of malignancy. Due to the anatomic complexity of this region, imaging techniques like Endoscopic Ultrasonography (EUS) and Fine Needle Aspiration (FNA) may fail to give a definitive diagnosis.

We had 1 case of Serous cystadenoma and 1 case of Brunner's gland hyperplasia, both presenting with radiological features suggestive of malignancy. Serous cystadenomas can manifest in the form of macro-, micro-, oligo-, or multicystic masses. Brunner's gland hyperplasia is a benign hyperplastic proliferation of mature Brunner glands, commonly in the duodenal bulb. Performing endoscopic retrograde cholangiopancreatography (ERCP) or EUS in the preoperative period will decrease the resection rate in benign lesions. In our benign cases, no previous interventional procedures were performed, no biopsy was performed, and the cases were directly operated due to suspicion after imaging.

We also reported a single case each of Intra-ampullary papillary tubular neoplasm (IAPN) and Intraductal mucinous papillary neoplasm (IPMN) of the pancreas. Both these tumours are grouped under low malignant potential tumours. IAPN is an intraluminal polypoid or papillary mass-forming exophytic lesion within a dilated ampullary duct. IPMN is an invasive mucinous epithelial neoplasm arising from the main pancreatic duct or branch ducts, usually > 5 mm, composed of various cell types with various cytologic and architectural atypia. LVI, PNI, and lymph node metastasis were characteristically absent in both cases.

In our study, we had one case of Pancreatic Non-Hodgkin's Lymphoma (NHL). NHL commonly affects extranodal organs while the involvement of the pancreas is primarily rare and can be with or without the involvement of lymph nodes around the pancreas. Differentiation of primary pancreatic lymphoma (PPL) and adenocarcinoma is important due to different treatment and better prognosis; however, the symptoms of PPL are not specific and can mimic adenocarcinoma. PPL can often be seen as a mass larger than 5 cm in the pancreas while unlike adenocarcinoma, no vascular involvement is commonly

observed. The definitive diagnosis of PPL is impossible based on imaging and it requires pathological examination [29].

Whipple's pancreaticoduodenectomy has been associated with a high rate of morbidity (40%–60%) and a mortality rate of up to 20%. Over the decades, perioperative mortality has been reduced from 25% to 4%–5%. Some centers that perform a high volume of pancreaticoduodenectomy procedures have even lower mortality rates of 1%–1.5% [17].

Conclusion

Whipple's PD specimens require a thorough knowledge of the anatomy of the region as well as a meticulous grossing of the specimens. Our study highlights the fact that the important prognostic factors are tumour grade, tumour stage, presence of LVI, PNI, positive margins, and lymph node metastasis. This is well correlated by the significant p-value of PNI, LVI, lymph node metastasis, and tumor grading in our study. The majority of our cases were diagnosed at a relatively advanced stage. Thus, thorough sectioning, careful evaluation of the margins, adequate lymph node sampling, and categorisation of the histological types is important in predicting the patient survival outcome. Also, more precise assessment and clinical evaluation can lead to early detection of cancer, and timely intervention can improve survival rates.

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