

Histopathological Spectrum of Pancreatic and Periapillary Lesions in a Tertiary Care Centre

T. Mitila¹, Reshmi.G^{2*}, Chitra Srinivasan³, Vimal Chander⁴

^{1,2}Final Year Postgraduate, ³Professor and HOD, ⁴Professor,
Dept. of Pathology, Saveetha Medical College, Chennai

***Corresponding Author:**

Reshmi. G

Final year Postgraduate, Dept. of Pathology, Saveetha Medical College, Chennai

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Abstract

Background: Pancreatic neoplasms constitute a broad spectrum of benign and malignant tumours. Periapillary region is a complex region composed of the head of pancreas, distal common bile duct, second portion of the duodenum, and ampulla of Vater. Tumours arising from these structures constitute periampillary tumours.

Objective: To analyse histopathologically, the spectrum of pancreatic and periampillary lesions.

Material and Methods: This retrospective descriptive study was done with 52 cases of histopathologically proven neoplastic and non-neoplastic lesions of the pancreas and periampillary region over a period of 6 years (July 2015 to June 2021) received in the department. Clinicopathological data collected and analyzed with records from the Department of Pathology, Saveetha Medical College.

Results: Among the 52 cases included, 31 (59.6%) were males. The mean age overall was 48.2 years. 32 cases were of pancreatic origin and 20 were periampillary lesions. Neoplastic lesions contributed to 26 (50%) of the total cases, of which 25 cases were malignancies, including 20 adenocarcinomas, 1 case of Malignant peripheral nerve sheath tumor (MPNST) pancreas, 2 cases each of solid pseudopapillary tumour (SPPT) of pancreas and neuroendocrine tumours. One case of benign cystadenoma was reported. 14 patients underwent Whipple's resection for ampillary adenocarcinomas, most of which were well-differentiated tumours, with 9 and 5 cases of intestinal and pancreaticobiliary types respectively. Non-neoplastic cases were 26 in number, among which 17 were chronic pancreatitis and 3 pancreatic pseudocysts.

Conclusion: Histopathology remains the gold standard for the diagnosis of pancreatic lesions. An equal incidence of neoplastic and non-neoplastic lesions was seen. Adenocarcinoma was the most common lesion reported.

Keywords: pancreas, periampillary, histopathological spectrum, ampillary carcinoma, Whipple's

Introduction

Pancreatic cancer is the 12th most frequently occurring cancer among women and an important cause of morbidity and mortality worldwide [1]. However, in developing countries like India, relatively low incidence has been noted in India (rates ranging from 0.5-2.4/100000 person per year in females and 0.2-1.8/100000 persons per year in

males) [2]. According to GLOBOCAN 2020, it is the 7th most common cause of cancer related deaths [1]. Pancreatic lesions show a broad spectrum with respect to benign, malignant, and non-neoplastic disease patterns. Pancreatic ductal adenocarcinoma constitutes 80-90% of all pancreatic malignancies [3]. With symptoms related to pancreatic cancer being non-specific, it contributes to late detection and therefore poor outcome developing countries [2].

Yet, early evaluation of precursor lesions before they transform into incurable invasive cancers is crucial to alleviate the anxiety of patients as this can be lifesaving [4]. Though clinical and radiological examinations are important screening tools, histopathological examination remains the gold standard in accurately diagnosing the pancreatic lesions, assessing the treatment adequacy and prognosis of the disease.

Periampullary region is a complex region composed of head of pancreas, distal common bile duct, second part of duodenum and ampulla of Vater [3]. Tumours arising from this region constitute periampullary tumours. The ampullary papilla is lined by intestinal mucosa while the other parts are lined by pancreaticobiliary type of simple mucinous epithelium. Thus, ampullary carcinomas may arise from two different types of mucosae- intestinal and pancreaticobiliary types [3]. Several studies have classified periampullary carcinoma subtypes using the above morphologic criteria alone or in combination of a panel of immunohistochemistry (IHC) markers, and this histological subtyping is an important prognostic factor [5].

This study was aimed to evaluate the spectrum of pancreatic and periampullary lesions and their correlation with clinicopathological parameters, and to emphasize on rare malignancies occurring in pancreas.

Materials And Methods

This retrospective descriptive study was done for a period of 6 years from July 2015 to June 2021 on pancreatic and periampullary lesions in a tertiary care centre. 52 cases were diagnosed histologically during

the study period. The details of all cases during the study period were collected from the tumor register. Patients with neoplastic and non-neoplastic lesions of pancreas and tumours (including the head of pancreas involving the ampullary region) and non-neoplastic lesions of the periampullary region; and all small biopsy specimens were included in this study. Patients with Cases without proper data, inadequate specimen and cases with indefinite diagnosis, lesions in the distal part of duodenum and proximal common bile duct were excluded from the study.

The data collection was started following ethical committee approval.

Results

Of the 52 samples received at the department, majority were biopsy specimens, mostly done for pancreatic lesions. This was followed by pancreaticoduodenectomy specimens, all of which were diagnosed to be ampullary adenocarcinomas. Cyst excision was done for pancreatic pseudocysts. [Table 1]

In this study, 60% were males [Fig.1]. The mean age of our study population was 48.2 years (range 18-76 years), with 41-50 years being the most common age group involved. The age distribution of the study population is shown in Fig.2.

The distribution of neoplastic and non-neoplastic lesions of the pancreas are shown in Fig. 3. The most common pancreatic neoplasm was ductal adenocarcinoma, followed by 2 cases each of neuroendocrine tumours and solid pseudopapillary neoplasms. Chronic pancreatitis constituted 17 of the 52 lesions in total.

Figure 1: Sex distribution of neoplastic and non-neoplastic lesions

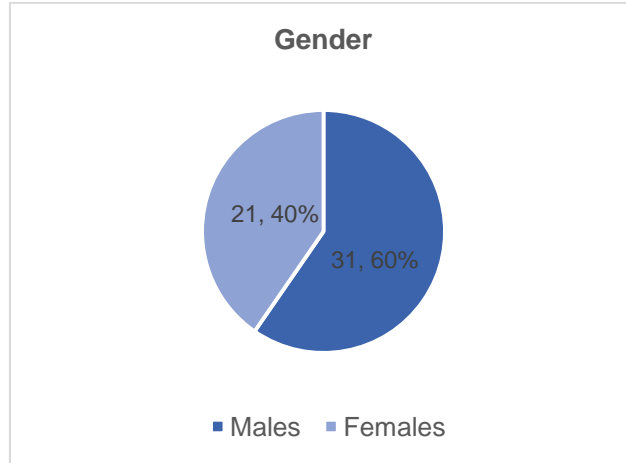


Figure 2: Age distribution of neoplastic and non-neoplastic lesions

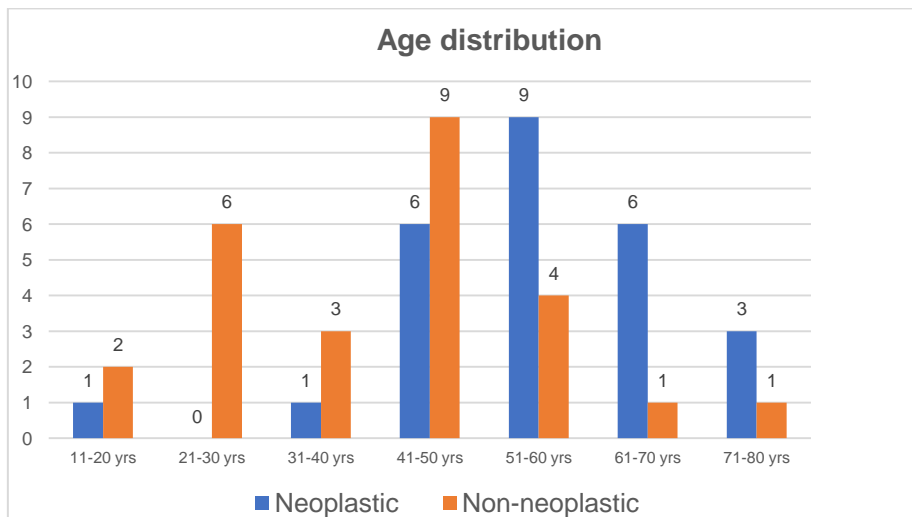
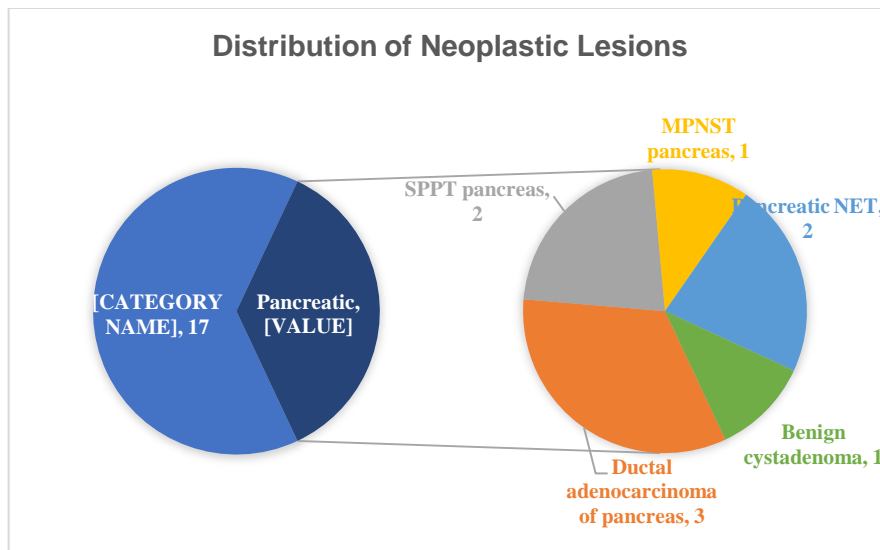
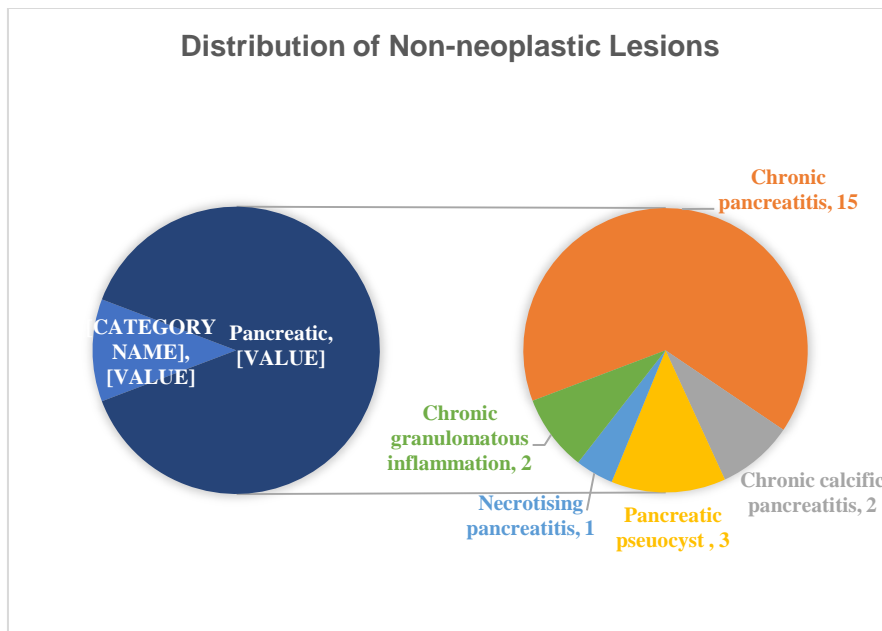


Figure 3: Distribution of neoplastic and non-neoplastic lesions





Of the 20 periampullary lesions, all the 3 non-neoplastic lesions were biopsy samples from the ampulla of Vater which showed non-specific inflammation. Among the 17 were neoplastic lesions, 14 were ampullary adenocarcinomas diagnosed on pancreaticoduodenectomy specimens; 2 were periampullary duodenal adenocarcinomas and 1 was a case of pancreatic head ductal adenocarcinoma involving the ampullary region.

Of the 14 ampullary adenocarcinomas diagnosed on Whipple’s specimens, there were 9 and 5 cases of intestinal and pancreaticobiliary histologic types respectively. Most of them were diagnosed with Stage I tumours, followed by Stage IIA and Stage IIIA, according to 8th Edition, AJCC Staging Manual. One case of intestinal type adenocarcinoma showed involvement of a resected margin (posterior) showing moderate differentiation, belonging to Stage IIIB (pT3bN2), with both lymphovascular and perineural invasion by the tumour cells. 2 cases of intestinal type and 1 of pancreaticobiliary type showed lymph node metastasis. Also 2 and 1 case each of these types showed lymphovascular and perineural invasion respectively.

Figure 4: Malignant peripheral nerve sheath tumour of pancreas

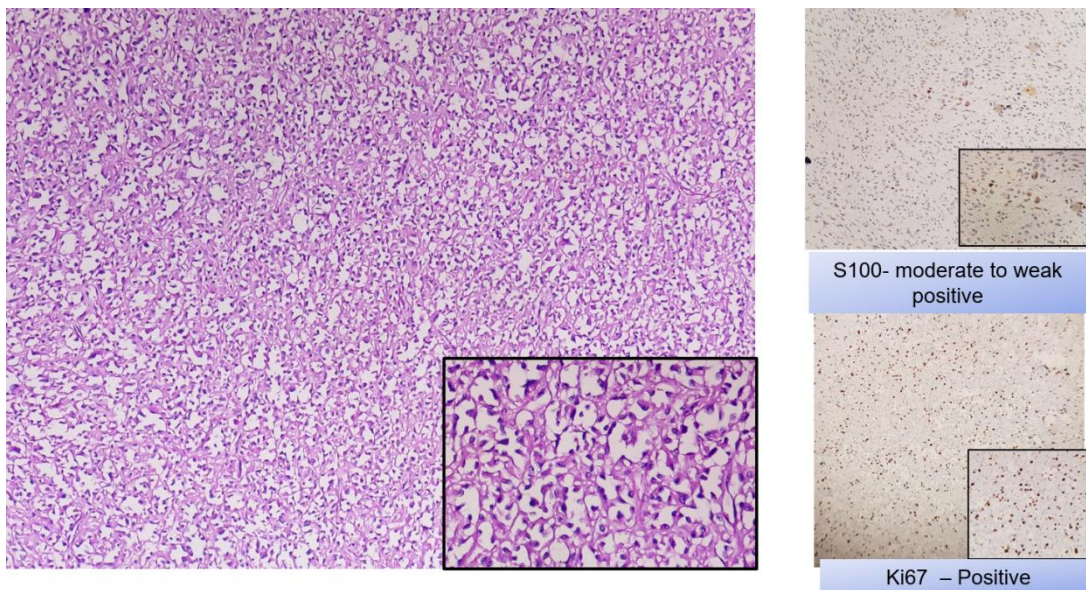


Figure 5: Pancreatic neuroendocrine tumour

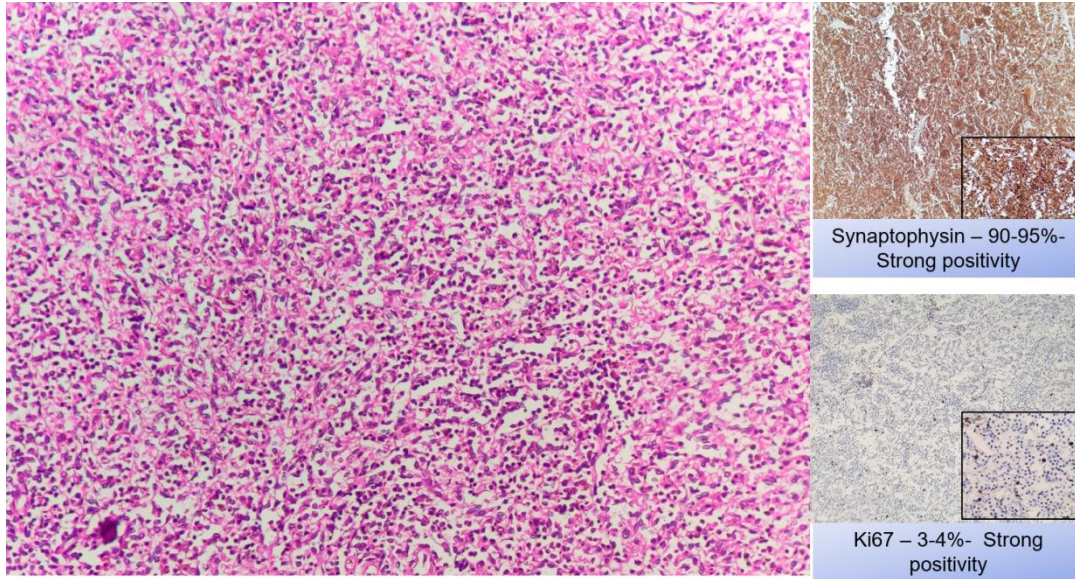


Figure 6: Solid pseudopapillary tumour of pancreas

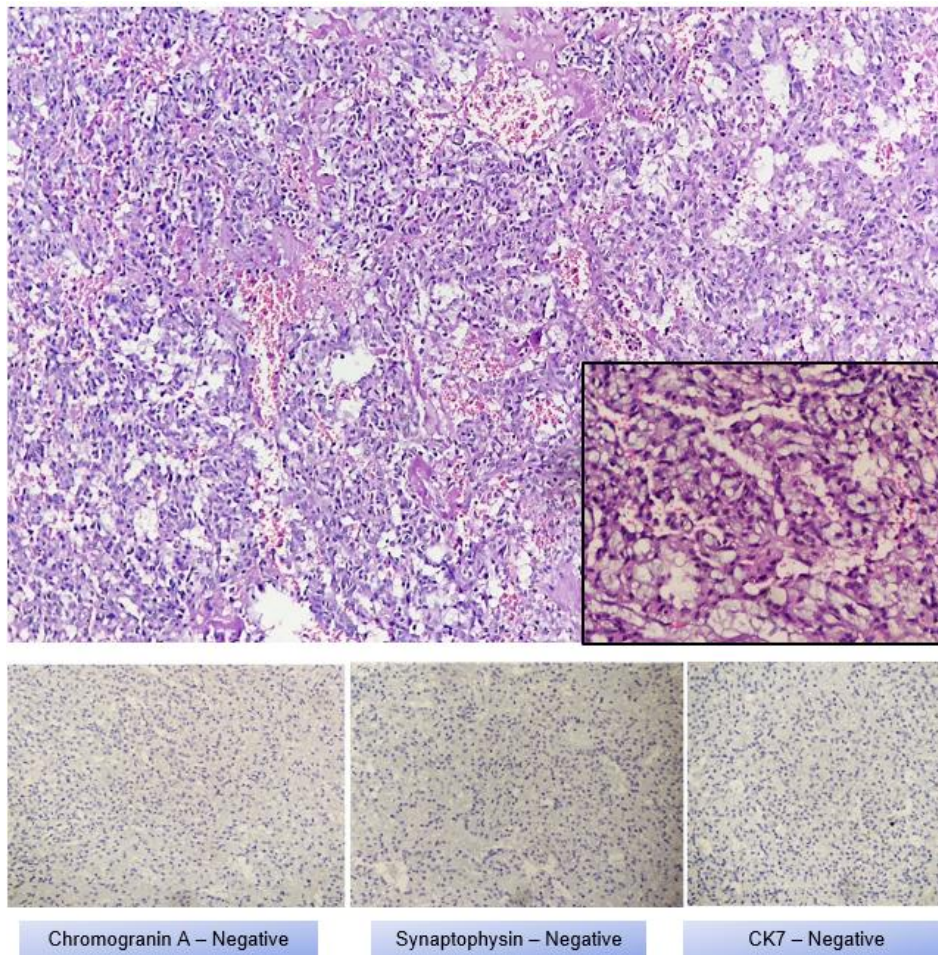


Table 1: Samples received based on the procedure

Procedure	Pancreatic lesions	Periampullary lesions	Total lesions
Biopsy	22	6	28
Cyst Excision	3	-	3
Frey's Procedure	2	-	2
Distal Pancreatectomy	2	-	2
Distal Pancreatectomy and Splenectomy	3	-	3
Whipple's Procedure (Pancreaticoduodenectomy)	-	14	14

Table 2: Features of ampullary adenocarcinomas

Ampullary Adenocarcinoma	Histological Type	Intestinal Type (n=9)	Pancreaticobiliary Type (n=5)
Tumour size	Intraampullary	5	2
	Periampullary	3	2
	Both (Mixed type)	1	1
Histologic Grade	Well differentiated	6	3
	Moderately differentiated	3	2
	Poorly differentiated	0	0
pTNM Staging	Stage 0	0	0
	Stage I	5	3

	Stage IIA	2	1
	Stage IIB	0	0
	Stage IIIA	1	1
	Stage IIIB	1	0
	Stage IV	0	0

Table 3: Comparison with Basina et al study

	Basina et al (05-02-2020) [3] n=39	Current study n=52
Sex distribution		
Males	29 (75%)	31 (60%)
Female	10 (25%)	21 (40%)
M/C age group		
Neoplastic lesions	51-60 years	51-60 years
Non-neoplastic lesions	21-30 years	41-50 years
Neoplastic lesions	28 (71.8%)	26 (50%)
Non-neoplastic lesions	11 (28.2%)	26 (50%)
Pancreatic lesions	13 (33.3%)	14 (26.9%)
Periampullary lesions	26 (66.6%)	38 (73.1%)
Benign tumours	1 (2.5%)	1 (1.9%)
Malignant tumours	27 (69.2%)	25 (48.1%)
Ampullary adenocarcinomas	(n=15) 8	(n=14) 9
Intestinal type	5	5
Periampullary type	2	0
Mixed type		

Discussion:

Diagnosis of pancreatic cancer can sometimes be difficult. A benign reactive gland of chronic pancreatitis can simulate an infiltrating gland of well-

differentiated pancreatic cancer [7]. In this study, spectrum of lesions of pancreas and periampullary region was evaluated.

Overall M:F ratio was 3:2. This was similar to that in the studies by Arthi et al (62%) [6] and Joseph et al (56%) [7]. The most common non-neoplastic lesion was chronic pancreatitis (53.1%), followed by pancreatic pseudocyst (9.4%). The peak incidence was seen in the age group 41-50 years (28.8%), in correlation with Arthi et al study, where non-neoplastic lesions were common seen in 41-60 years age group [6]. Most of the lesions of pancreas were seen to arise from the head. The most common non-neoplastic lesion reported was chronic pancreatitis. In the study by Frulloni et al, alcohol intake was seen to be the most important risk factor in chronic pancreatitis [9]. Other important risk factors included genetic factors, ductal obstruction, and smoking [16]. There were 3 cases of pseudocyst of pancreas. These are termed pseudocysts as there is no epithelial lining of the cyst. The wall is instead lined granulation or fibrous tissue [13].

Among the various neoplastic lesions, the most common were pancreatic ductal adenocarcinomas (4 in number), comparable to Arthi et al study [6]. Of these, one case was seen to involve the periampullary region and was classified under periampullary neoplasms. 2 cases of solid pseudopapillary tumour (SPPT) both of which were seen in young women of age 20-30 years, one each arising from the body and tail of pancreas. Both the cases showed tumour confined to the pancreas. The case with tumour origin from body of pancreas showed both lymphovascular and perineural invasion. These tumours are of low malignant potential according to WHO, and characteristic history and histopathological findings can be diagnostic of this tumour. They can be confirmed by beta catenin IHC. Neuroendocrine tumours may be functional or nonfunctional based on hormone secretion. They are usually less aggressive than adenocarcinomas of pancreas [7]. In this study, there were 2 cases of neuroendocrine tumour which showed strong positivity for synaptophysin and Ki67 positivity by IHC. One was of histologic grade 1 and a case of grade 2 PanNET. Pancreas is a rare site for the development of malignant peripheral nerve sheath tumour (MPNST). This patient had associated papillary carcinoma of thyroid.

Although the sample size is a major limitation of this study, the results are well comparable with the previous studies in the literature.

Conclusion

In this study, the peak incidence of neoplasms was noted among the age group 51-60 years and the majority of the ampullary adenocarcinomas belonged to Stage I. Adenocarcinoma was the most common lesion reported in this study. Histopathology plays an essential role for the diagnosis of many lesions presenting as cystic and solid masses, alleviating the need for unnecessary radical surgeries. Immunohistochemistry is advisable in a few lesions which have a malignant potential, but with a good prognosis, especially SPPT, and few others like NET for grading, given that these are less aggressive than pancreatic adenocarcinoma. Pathologic assessment of pancreaticoduodenectomy (Whipple resection) specimens need special attention to evaluate important prognostic factors like location, extension, histologic grade, status of margins / surfaces, lymphovascular invasion, perineural invasion and lymph node status.

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Ethical approval

Ethical clearance- Institutional ethics committee approval was obtained.

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