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Surgical Management of Solid Pseudopapillary Tumor of the Pancreas - An Observational Study

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Abstract

Introduction: Solid pseudopapillary tumors (SPT) of the pancreas are rare neoplasms that predominantly affect young females. This study aimed to investigate the demographic characteristics, clinical presentations, tumor locations, surgical treatments, and outcomes in a cohort of patients with SPT in Bangladesh.

Methods: This retrospective observational study was conducted at the Department of Hepatobiliary, Pancreatic and Liver Transplantation Surgery, Bangabandhu Sheikh Mujib Medical University, Al-Manar Hospital Limited and Abeer General Hospital, Dhaka, Bangladesh. Hospital records of 36 patients with histopathologically confirmed SPT, aged between 18 and 49 years, were included for the study. Data on demographic characteristics, clinical presentations, tumor location, surgical treatment, and outcomes were collected and analyzed using SPSS software V.25.

Result: The majority of patients were in the 18-29 age range (66.67%) and female (86.11%). The most common clinical presentation was abdominal pain or discomfort (44.44%), followed by a palpable abdominal mass (25.00%). Notably, 30.56% of patients were asymptomatic. The most common tumor location was the tail of the pancreas (30.56%). Distal pancreatectomy with splenectomy was the most common surgical treatment (55.56%). Complete tumor resection was achieved in 94.44% of patients, with only 5.56% having residual tumor. Postoperative complications were reported in 13.89% of cases.

Conclusion: This study highlights the demographic and clinical characteristics of patients with SPT in Bangladesh, as well as the surgical management and outcomes. The findings are largely consistent with existing literature, emphasizing the importance of appropriate surgical management and postoperative care for patients with SPT. Further investigation into regional factors that may affect tumor location distribution is warranted.

Keywords: Tumor; Pancreas; Papillary; Pseudopapillary

Introduction

Solid pseudopapillary tumor (SPT) of the pancreas, also known as solid pseudopapillary neoplasm, is a rare and enigmatic pancreatic neoplasm, accounting for approximately 1-2% of all pancreatic tumors [1]. This tumor predominantly affects young women, with a female-to-male ratio of approximately 10:1 [2]. Although the etiology of SPT remains unknown, studies have suggested the involvement of genetic mutations, such as CTNNB1 gene, which encodes the beta-catenin protein [3,4]. Globally, the incidence of SPT has been reported to be increasing, possibly due to the advancements in diagnostic imaging techniques and increased awareness among clinicians [5].

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In Bangladesh, the prevalence of SPT is scarce, with only a few case reports published in the literature [6]. However, with a population of over 160 million, the burden of pancreatic tumors in Bangladesh cannot be underestimated. Risk factors and comorbidities associated with SPT have not been well-established, given the rarity of this tumor. Nonetheless, studies have demonstrated a possible association between the development of SPT and a history of pancreatitis or pancreatic trauma [7,8]. Further investigations are required to elucidate potential risk factors that could be contributing to the development of SPT in the Bangladeshi population. SPTs are generally considered to have a low malignant potential, with most cases exhibiting indolent behavior and favorable prognosis [9]. However, metastatic disease and local invasion can occur in a minority of patients, leading to increased morbidity and mortality. The 5-year survival rate for SPT patients is reported to be as high as 97%, with most deaths attributed to tumor recurrence or metastasis [10]. The cornerstone of SPT management is surgical resection, which offers the best chance for long-term survival [11]. The surgical approach depends on the tumor's location, size, and extent of invasion. Complete surgical resection, either by pancreatoduodenectomy or distal pancreatectomy, is the treatment of choice, and it is associated with excellent long-term outcomes [12,13]. However, in cases of unresectable or metastatic disease, chemotherapy and radiation therapy may be employed as palliative measures [14]. In Bangladesh, the healthcare system faces significant challenges, including limited resources, inadequate infrastructure, and a shortage of skilled healthcare professionals [15]. (Anwar et al., 2009). As a result, the management of rare and complex diseases like SPT may be compromised. This observational study aims to investigate the surgical management of SPT in Bangladesh, its efficacy, and its impact on patient outcomes. By examining the surgical management of SPT in Bangladesh, this study will contribute valuable insights to the existing literature and help to identify potential areas for improvement in the diagnosis and treatment of this rare pancreatic tumor. Ultimately, this research may lead to better understanding, improved management strategies, and enhanced patient outcomes for those affected by SPT in Bangladesh and beyond.

Methods

This retrospective observational study was conducted at the Department of Department of Hepatobiliary, Pancreatic and Liver Transplantation Surgery of the Bangabandhu Sheikh Mujib Medical University, Al-Manar Hospital Limited and Abeer General Hospital, Dhaka, Bangladesh. The study duration was 7 years, from January 2016 to December 2022. During this period, hospital records of a total of 36 patients with solid pseudopapillary tumors (SPT) of the pancreas were included for the study following

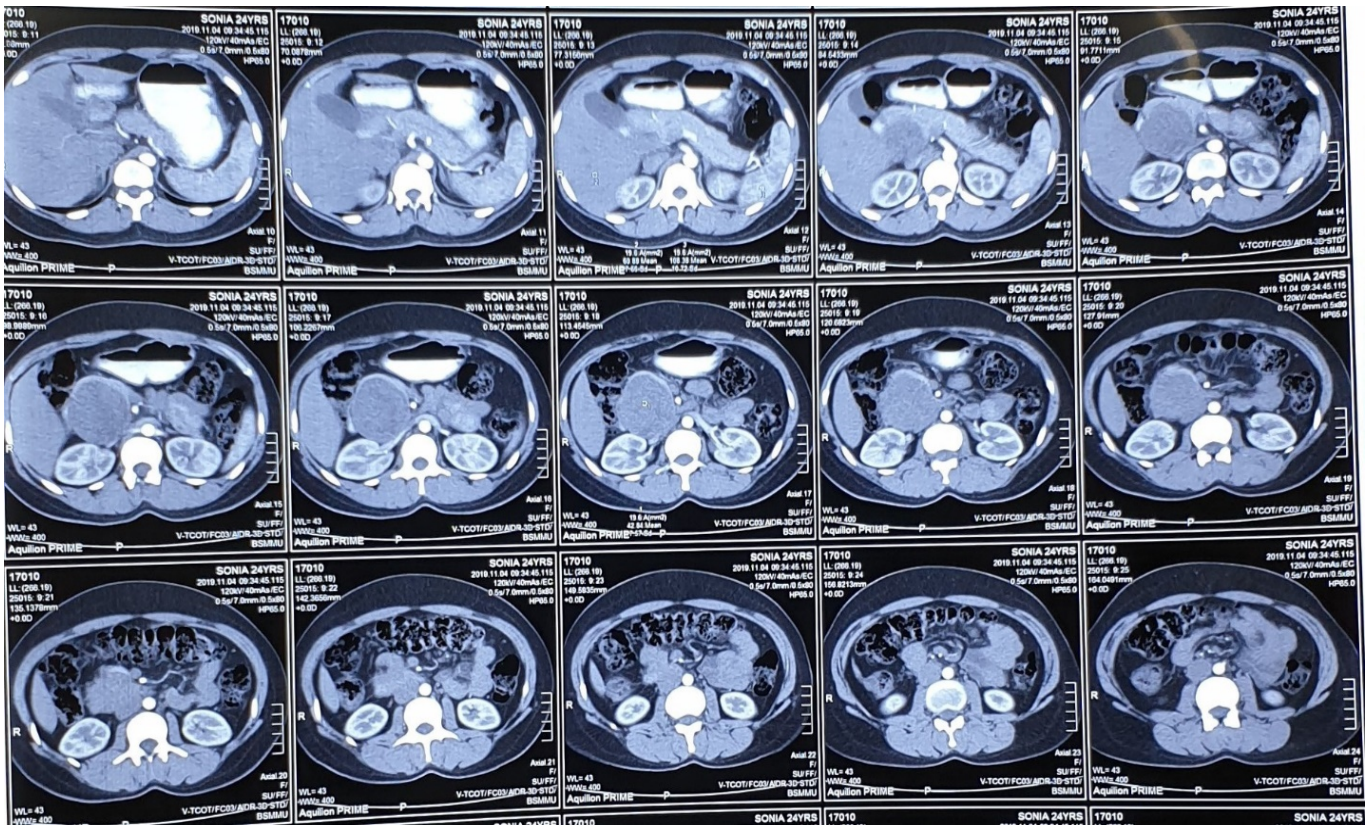

Figure 1: CT scan of a Solid Pseudopapillary Tumor

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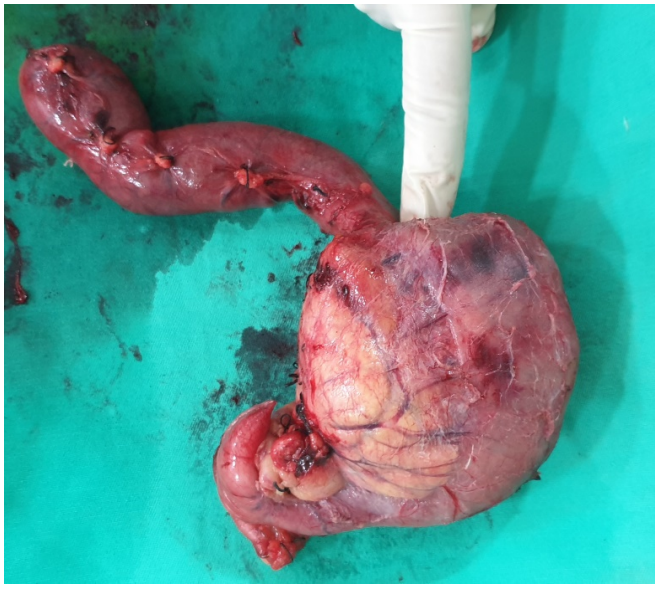

Figure 2: Specimen of a solid pseudopapillary tumor

Table 1: Distribution of participants by demographic characteristics (N = 36)

Variables	Frequency	Percentage
Age Range		
18-29	24	66.67%
30-39	8	22.22%
40-49	4	11.11%
Gender		
Male	5	13.89%
Female	31	86.11%

Table 2: Distribution of participants by clinical presentations (N = 36)

Clinical Presentation	Frequency	Percentage
Abdominal pain or discomfort	16	44.44%
Palpable abdominal mass	9	25.00%
Jaundice	7	19.44%
Weight loss	5	13.89%
Asymptomatic	11	30.56%

Table 3: Distribution of participants by location of tumor (N = 36)

Tumor Location	Frequency	Percentage
Head	9	25.00%
Uncinated process	2	5.56%
Body	5	13.89%
Tail	11	30.56%
Body and tail	9	25.00%

Table 4: Distribution of participants by type of Surgical treatment (N = 36)

Surgical Treatment	Frequency	Percentage
Distal pancreatectomy with splenectomy	20	55.56%
Distal pancreatectomy with spleen preservation	4	11.11%
Pancreatoduodenectomy	9	25.00%
Central pancreatectomy	2	5.56%
Laparoscopy with tumor biopsy	1	2.78%

Table 5: Distribution of participants by treatment outcome (N = 36)

Outcome	Frequency	Percentage
Complete Tumor Resection	34	94.44%
Residual Tumor	2	5.56%
Post-Operative complications	5	13.89%

inclusion and exclusion criteria. Patients aged between 18 and 49 years, with a histopathologically confirmed diagnosis of SPT, were included in the study. The exclusion criteria comprised patients with other histopathological diagnoses, those who had received prior treatment for SPT, and patients with incomplete medical records. Data on demographic characteristics, clinical presentations, tumor location, surgical treatment, and outcomes were collected from patient records and analyzed. The results were then compared with existing literature to identify trends and discrepancies in the presentation, management, and outcomes of SPT. All collected data was analyzed using SPSS software V.25, and presented in tabular format.

A total of 36 patients with solid pseudopapillary tumors (SPT) of the pancreas were included, with the majority (66.67%) falling in the 18-29 age range, followed by 22.22% in the 30-39 age range, and 11.11% in the 40-49 age range.

Abdominal pain or discomfort was the most common symptom (44.44%), followed by a palpable abdominal mass (25.00%), Jaundice (19.44%), and weight loss (13.89%). Notably, 30.56% of patients were asymptomatic, emphasizing the varied clinical manifestations of SPT.

The most common location of the tumor was the tail (30.56%), followed by the head (25.00%) and the body and tail combined (25.00%). Tumors located in the body and the uncinated process represented 13.89% and 5.56% of cases, respectively.

The majority underwent distal pancreatectomy with splenectomy (55.56%), while 11.11% had distal pancreatectomy with spleen preservation. Pancreatoduodenectomy was performed in 25.00% of cases, and central pancreatectomy and laparoscopy with tumor biopsy each accounted for 5.56% & 2.78% respectively of the surgical treatments.

The majority of participants, 94.44%, achieved complete tumor resection, indicating successful treatment. Only 5.56% of participants had residual tumor, indicating a need for further treatment. Additionally, 13.89% of participants experienced post-operative complications, highlighting the importance of careful monitoring and management of patients after surgery.

Discussion

In the present study, 36 patients with solid pseudopapillary tumors (SPT) of the pancreas were included, showing a higher prevalence among younger individuals, with 66.67% aged 18-29 years, followed by 22.22% aged 30-39 years, and 11.11% aged 40-49 years. This finding aligns with the existing literature, which indicates that SPT predominantly affects younger individuals [2]. The age distribution observed in this study is also consistent with the findings of Papavramidis and Papavramidis, who reported a similar pattern in their review of 718 cases [1]. Regarding the clinical presentation, abdominal pain or discomfort was the most common symptom (44.44%), followed by a palpable abdominal mass (25.00%), jaundice (19.44%), and weight loss (13.89%). Interestingly, 30.56% of patients were asymptomatic, emphasizing the varied clinical manifestations of SPT. These findings are in line with those reported by Law et al., who conducted a systematic review and found that the majority of patients with SPT presented with abdominal pain or discomfort, followed by a palpable mass, and a significant proportion were asymptomatic [10]. The most common location of the tumor was the tail (30.56%), followed by the head (25.00%) and the body and tail combined (25.00%). Tumors located in the body and the uncinated process represented 13.89% and 5.56% of cases, respectively. The tumor location distribution is somewhat different from the results reported by Yu et al. (2010), who found that the majority of tumors were located in the head of the pancreas [2]. The discrepancies in tumor location distribution may be attributed to differences in sample sizes, patient populations, or regional factors that warrant further investigation. The majority of participants underwent distal pancreatectomy with splenectomy (55.56%), while 11.11% had distal pancreatectomy with spleen preservation. Pancreatoduodenectomy was performed in 25% of cases, and central pancreatectomy and laparoscopy with tumor biopsy each accounted for 5.56% & 2.78% respectively of the surgical treatments. The surgical approach used in the current study is consistent with recommendations in the literature for managing SPT [3]. In terms of surgical outcomes, 94.44% of participants achieved complete tumor resection, indicating successful treatment. This high success rate is consistent with the findings of Estrella et al., who reported a similarly high rate of complete tumor resection in their study. Only 5.56% of participants had residual tumor, indicating a need for further treatment [9]. Additionally, 13.89% of participants experienced post-operative complications, highlighting the importance of careful monitoring and management of patients after surgery. The complication rate observed in this study is comparable to the rates reported by Castro et al., who found that SPT patients experienced a similar range of postoperative complications [16]. In conclusion, the present study's findings are largely consistent with the existing literature on the clinical presentation, tumor location, surgical management, and outcomes of SPT. The discrepancies in tumor location distribution may be attributed to differences in sample sizes, patient populations, or regional factors that warrant further investigation. The high success rate of complete tumor resection and comparable postoperative complication rates underscore the importance of appropriate surgical management and postoperative care for patients with SPT.

Limitations of the study

The study was conducted in a three hospital with a small sample size. So, the results may not represent the whole community.

Conclusion

In conclusion, the present study's findings are largely consistent with the existing literature on the clinical presentation, tumor location, surgical management, and outcomes of SPT. The discrepancies in tumor location distribution may be attributed to differences in sample sizes, patient populations, or regional factors that warrant further investigation. The high success rate of complete tumor resection and comparable postoperative complication rates underscore the importance of appropriate surgical management and postoperative care for patients with SPT.

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Conflict of interest

None declared

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