

## Laparoscopic Pancreatectomy and Splenectomy for A Solid Pseudopapillary Neoplasm in A Teenager: A Case Report

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Received: 02 Jan 2025

Accepted: 10 Jan 2025

Published: 21 Jan 2025

J Short Name: COS

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### Citation:

Ahmed AlSalem. Laparoscopic Pancreatectomy and Splenectomy for A Solid Pseudopapillary Neoplasm in A Teenager: A Case Report. Clin Surg. 2025; 11(3): 1-4

### Keywords:

Solid Pseudopapillary Tumor; Partial Pancreatectomy; Laparoscopy

## 1. Abstract

### 1.1. Introduction

Pancreatic pathology is relatively rare in children and among the pancreatic tumors, solid pseudopapillary tumor of the pancreas is considered very rare in children. We report a teenager girl who underwent laparoscopic pancreatectomy and splenectomy for a large solid pseudopapillary tumor of the pancreas.

### 1.2. Case Presentation

A 13-year-old girl was admitted to the hospital following a blunt abdominal trauma. Prior to this, she was asymptomatic and clinically she was healthy and her vital signs were stable. Her investigations included abdominal ultrasound, CT-scan and MRI. Abdominal ultrasound, CT-scan and MRI showed a thick-walled complex cystic mass in the tail of the pancreas measuring 5 x 5 x 5.1 cm and showing heterogenous contrast enhancement. She was vaccinated preoperatively including pneumococcal, meningococcal and H influenza vaccines. She underwent laparoscopic partial pancreatectomy and splenectomy to resect the tumor and histopathology showed a solid pseudopapillary tumor of the pancreas. Postoperatively she did well and she was discharged home in a good general condition.

### 1.3. Conclusion

Solid pseudopapillary tumor of the pancreas is rare in children.

Solid pseudopapillary tumor of the pancreas can be resected laparoscopically. Every attempt should be made to preserve the spleen during surgery but in large tumors like in our patient splenectomy cannot be avoided. These children should be immunized preoperatively with pneumococcal, meningococcal and H influenza vaccines to decrease the risk of post-splenectomy sepsis.

## 2. Introduction

Solid pseudopapillary tumor is a rare primary neoplasm of the pancreas. It is a relatively a benign tumor, with a favorable prognosis and commonly affects young women and rarely seen in children. It is usually characterized by a well encapsulated mass, with low malignant potential. It is relatively rare in children and complete resection is curative in most cases [1-4]. In this report we describe successful laparoscopic pancreatectomy and splenectomy for a teenager girl who was found to have solid pseudopapillary tumor of the pancreas outlining the clinical features, diagnosis, treatment and outcome.

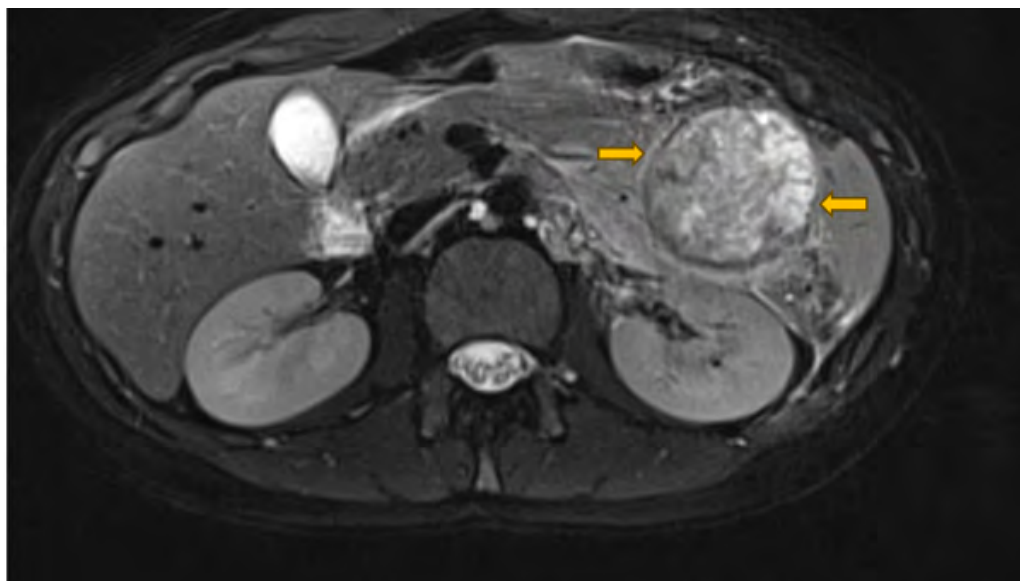
## 3. Case Report

A 13-year-old girl presented to the hospital following a blunt abdominal trauma. Prior to this, she was a healthy girl and asymptomatic. At the time of admission, she was only complaining of mild abdominal pain following the blunt abdominal trauma. There was no vomiting and she was tolerating oral intake. Clinically, she was

afebrile and her abdominal examination was normal. She was investigated initially with an abdominal ultrasound which showed a thick-walled complex cystic mass in the tail of the pancreas measuring 49X48 mm. Abdominal CT-scan also showed a thick-walled complex cystic mass in the tail of the pancreas measuring 49X48 mm. The mass demonstrates some peripheral nodular enhancement following intravenous contrast injection. The pancreatic duct was not dilated and no communication with the pancreatic duct was demonstrated. The duodenum appears nicely distended following the administration of water and Buscopan (Figures 1a, 1b, 2a and 2b). Abdominal MRI showed a well-defined mass in the tail of the pancreas measuring 5 x 5 x 5.1 cm and showing heterogeneous contrast enhancement. The pancreatic duct was normal and no other pathology was identified (Figures 1 and 2).

It was decided to resect the tumor laparoscopically. Preoperatively, she was given meningococcal vaccine, 23 polyvalent pneumococcal vaccine and H influenza type B vaccine. She underwent laparoscopic distal pancreatectomy with splenectomy. Under general anesthesia, in supine position, a Foley catheter was inserted. The patient was positioned with the left side elevated and the patient was fixed to the operating table. An open technique was used to insert a 12-mm trans umbilical trocar. A 10-mm, 30-degree camera was used to explore the abdomen. Another 12-mm trocar was inserted on the left side at the same level of the umbilical trocar. Two more 5 mm trocars were inserted in the right upper quadrant and left upper quadrant. The procedure was started by mobilizing the splenic flexure using Liga Sure, dividing the lateral attachment and going medially to release the colon from the omentum. After that, the lesser sac was opened and division of the short gastric vessels was carried out up to the end. The exposure was extended by separating the stomach from the colon attachment medially. The tumor was found to be large and occupying the tail and part of

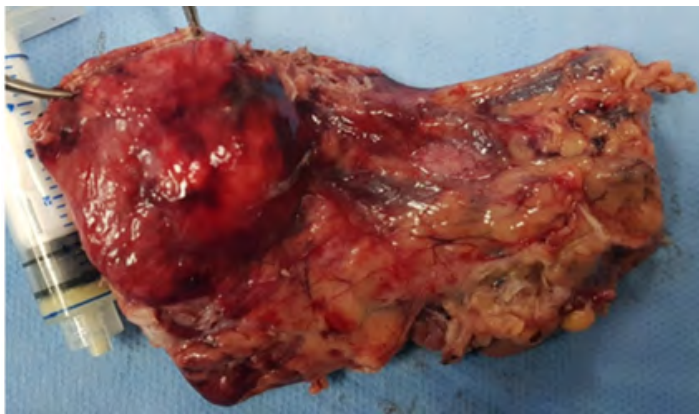
the body of the pancreas. The pancreas was mobilized Using Liga Sure and completely freed posteriorly. The splenic vein was identified and we tried to mobilize the splenic vein but it was adherent to the tumor. The splenic artery was identified and dissected free. We tried to preserve the spleen but due to its close proximity to the tumor, the tumor size and the attachment to the splenic vein mainly it was difficult to preserve. It was decided to do distal pancreatectomy with splenectomy. The splenic artery was divided using an Endo Stapler with vascular cartridge. After that, the pancreas proximal to the tumor was mobilized and an umbilical tape was placed around the pancreas and this helped to elevate the pancreas and facilitated its dissection. The pancreas proximal to the tumor was divided using with a safe clear margin. The distal pancreas was completely released and the procedure was completed with splenectomy by releasing all the splenic attachments using Liga Sure. The pancreatic tail was divided from the splenic hilum using Liga Sure, the spleen was placed in a 10-mm bag, and removed through the umbilical incision after dividing the spleen in a piece-meal fashion. The resected pancreas with the tumor was removed en bloc after extending the umbilical incision. The camera was reintroduced to check for hemostasis. The proximal pancreatic cut edge was checked; there was no active bleeding and Floseal hemostatic agent was used to cover the transection site to decrease the risk of bleeding. A 15-mm drain was placed through the 5-mm left sided trocar site and left close to the pancreatic transection. The trocar sites were closed using Vicryl 4.0 for the fascia and Vicryl 5.-0 for the skin. The resected part showed a tumor in the tail of the pancreas which appeared mostly solid and histopathology showed a solid pseudopapillary tumor of the pancreas (Figures 3a and 3b). Postoperatively, she did well and was discharged home in a good general condition. On follow ups in the clinic up to 6 months post-operatively, she was doing well, asymptomatic and tolerating normal diet.



**Figure 1:** Abdominal MRI-scan showing a thick wall complex mass in the tail of the pancreas.



**Figure 2:** Abdominal MRI showing a complex mass in the tail of the pancreas. Note the thick wall of the mass and the peripheral nodular enhancement.



**Figures 3a and 3b:** Clinical photographs showing the resected mass in the tail of the pancreas and the cut section of the resected mass. Note the appearance of the tumor when compared with the adjacent pancreatic tissue.

#### 4. Discussion

Solid pseudopapillary tumor (SPT) of the pancreas was first described by Frantz in 1959 (4). It is a rare pancreatic tumor, which represents only about 1% of all tumors of the pancreas. In 1996, the World Health Organization labelled this tumor as a “solid pseudopapillary tumor” of the pancreas (5).

Solid pseudopapillary tumor of the pancreas is rare and commonly seen in young Asian and African-American women. It is much more common in females than males with a female to male ratio of 10:1.

It is commonly seen in young women and the mean age at presentation is 22 years. It is a very rare tumor in children and commonly these children are asymptomatic and the tumor is discovered during evaluation of other conditions like in our patient. Our patient sustained a blunt abdominal trauma and the tumor was discovered during her abdominal trauma evaluation.

Solid pseudopapillary tumor of the pancreas is a benign tumor but malignancy can occur in about 15% of cases (3). The malignant form can metastasize commonly to the liver and the omentum (1,2,6).

The majority of solid pseudopapillary tumors are located in the pancreatic body and tail. Grossly, solid pseudopapillary tumor of the pancreas can be solid or combine solid and cystic components with cellular degenerative changes (30). Solid pseudopapillary tumor of the pancreas are characteristically positive for  $\alpha 1$ -antitrypsin, CD56, CD10, and vimentin (3).

The diagnosis of solid pseudopapillary tumor of the pancreas can be made using abdominal ultrasound, CT scan and MRI. MRI is more valuable as it can define the hyper vascular, well-encapsulated, round tumors with mixed cystic and solid components. It is also possible to establish the diagnosis preoperatively and in the presence of experienced invasive radiologist by obtaining an FNA biopsy through an Echo-endosonography (3, 7).

Solid pseudopapillary tumor of the pancreas is considered a tumor with a low-grade malignant potential and has a favorable prognosis with a reported overall 5-year survival as high as 97% following surgical resection (8).

The treatment of solid pseudopapillary tumor of the pancreas is surgical resection even in the case of distant hepatic metastasis or local recurrence (9). This is commonly done through the open technique but currently, laparoscopic resection is feasible and safe even in children. Our patient underwent laparoscopic distal pancreatectomy with splenectomy and made an excellent recovery. During surgery every attempt should be made to preserve the spleen by meticulously dissecting the splenic vessels from the pancreas and tumor attachments but sometimes and as a result of the size of the tumor, its close proximity to the spleen, splenectomy cannot be avoided as in our patient. These patients should be immunized preoperatively against pneumococcal, meningococcal and Hemo-

philus influenza to decrease the risk of post-splenectomy sepsis.

In conclusion, solid pseudopapillary tumor of the pancreas is rare in children. Solid pseudopapillary tumor of the pancreas can be resected laparoscopically if the tumor is located in the body or tail of the pancreas. Every attempt should be made to preserve the spleen during surgery but in large and adherent tumors like in our patient splenectomy cannot be avoided. Our patient underwent laparoscopic distal pancreatectomy and splenectomy for a rare and large tumor of the pancreas and made an excellent postoperative recovery. These children should be immunized preoperatively with pneumococcal, meningococcal and H influenza vaccines to decrease the risk of post-splenectomy sepsis.

Statements:

1) Informed consent:

“Informed consent was obtained from the patient or guardian”

2) Authorship: Include the following statement:

“All authors attest that they meet the current ICMJE criteria for Authorship.”

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