

Cystic Neoplasms of Pancreas – Surgical Outcome and Management

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Abstract:

Aims: To analyse the outcome following surgical resection for cystic neoplasms of pancreas.

Methodology: This is a prospective observational study from retrospectively collected data of all patients who underwent surgery for cystic neoplasms of pancreas from January 2012 to December 2018. These patients were followed up and the outcome in terms of complications and recurrence were analysed.

Results: A total of 20 patients with cystic neoplasms of pancreas as diagnosis underwent surgery during this period. Females were more commonly affected than males. Most common type in our case series was solid pseudopapillary neoplasms. Most common location of tumour in our series was in body and tail. Most commonly done procedure was Distal pancreatectomy with splenectomy. 18 patients were without any recurrence during follow up.

Conclusion: Management of cystic neoplasms of pancreas depends on their location and curative surgery gives better longterm outcome.

Key Words: Cystic Neoplasms, Distal Pancreatectomy Splenectomy, Pancreaticoduodenectomy, Solid Pseudopapillary Tumour, Central Pancreatectomy

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I. Introduction

Cystic neoplasms of pancreas may present with wide variety of morphological, histological and clinical characteristics¹. They may be symptomatic or asymptomatic. Presentation depends on the histological type and location of pancreas in the pancreas^{1,2}. Their incidence has increased in recent years, one reason being improved imaging techniques. Management differs based on the symptoms and morphological appearance of the lesions in imaging. Although symptomatic lesions should be resected asymptomatic lesions of no malignant potential can be followed up and so accurate imaging diagnosis of the lesion is very much needed³⁻⁵.

II. Methodology

This is a prospective observational study from retrospectively collected data of all patients who underwent surgery for cystic neoplasms of pancreas from January 2012 to December 2018. All patients who underwent surgical resection as curative treatment for cystic lesions of pancreas with post operative histopathological report as cystic neoplasms during this study period were analysed. Peri operative data was collected and the patients were followed up for any recurrence. Pre operative imaging CECT or MRI done to evaluate the cystic lesion. Endoscopic ultrasound was done only in patients with diagnostic dilemma. Post operative routine imaging as per protocol was done even in asymptomatic patients to find out any recurrence. Any post operative and longterm complications if any was also documented and analysed. Statistical analysis was carried out using SPSS software.

III. Results

Totally 20 patients underwent surgical resection with curative intent during this period. Median age group of our series was 35 years (Range 15 years to 73 years). There were 18 females and two male patients (Table 1 and 2). All patients were symptomatic. Median duration of symptoms was 60 days with most common symptom being abdominal pain (75%). CECT was done in all patients with MRI done in 12 patients for additional diagnostic accuracy. Endoscopic Ultrasound was done in four patients in whom diagnostic difficulty was there in both imaging. Pre operative surgical evaluation was done in all patients as per protocol.

Table 1: Overall Group characteristics

Age (median in years)		35
Sex (M:F)		2:18
Symptoms	Abdominal pain	15(75%)
	Pain with jaundice	1(5%)
	Painless jaundice	1(5%)
	Abdominal lump	1(5%)
	Breathlessness with pancreaticopleural fistula	1(5%)
	Dyspepsia	1(5%)
Duration of symptoms (median days)		60
Imaging for diagnosis	CECT	20(100%)
	MRI	12(60%)
	EUS	4(20%)
Location of tumour	Body and tail	7(35%)
	Head	7(35%)
	Tail	5(25%)
	Body only	1(5%)
Surgery	Distal pancreatectomy with splenectomy	11(55%)
	Pancreaticoduodenectomy	7(35%)
	Central pancreatectomy	1(5%)
	Local excision	1(5%)
Histopathology	SPT(Frantz tumour)	11(55%)
	SCN	6(30%)
	MCN	2(10%)
	IPMN	1(5%)

CECT – Contrast Enhanced Computer Tomography, MRI – Magnetic Resonance Imaging, EUS – Endoscopic UltraSound, SPT – Solid Pseudopapillary Tumour, SCN – Serous Cystic Neoplasms, MCN – Mucinous Cystic Neoplasms, IPMN – Intraductal Papillary Mucinous Neoplasms

Table 2: Post operative and follow up

Post operative stay (Median days)		10	
Post operative complications	Delayed gastric emptying		8(40%)
	Pancreatic fistula	Biochemical leak grade A	5(25%)
		Grade B	2(10%)
	Bile leak		1(5%)
	Gastric fistula		1(5%)
	Surgical site infection		5(25%)
	Incisional hernia during follow up		1(5%)
Mortality		2(10%)	
Median Follow up in months		35	
Recurrence		0	

Most common location of lesion was in head region (35%) followed by combined body and tail (35%), tail (25%), body only (5%). Most common surgical procedure done was Distal pancreatectomy with Splenectomy (DPS – 55%) among which one patient underwent laparoscopic distal pancreatectomy(Figure 1) and splenectomy and three patients lap assisted distal pancreatectomy with splenectomy. Next most commonly done procedure was pancreaticoduodenectomy (PD – 35%), followed central pancreatectomy in one patient (CP – 5%) and local excision in one patient (5%)(Table 3).

Figure 1: Distal Pancreaticosplenectomy Specimen - Solid Pseudopapillary tumour



Table 3: Management of various cystic neoplasms

Cystic neoplasms		SCN	MCN	IPMN	SPT
Number		6	2	1	11
Sex	Male	0	1	1	0
	Female	6	1	0	11
Symptoms	Abdominal Pain	3	2		10
	Abdominal pain and jaundice	1	0	0	0
	Painless jaundice	1	0	0	0
	Abdominal lump	0	0	0	1
	Breathlessness/ pancreaticopleural fistula	0	0	1	0
	Dyspepsia	1	0	0	0
Location	Body and tail	0	1	0	5
	Head	4	1	0	2
	Tail	1	0	1	3
	Body only	1	0	0	1
surgery	PD	4	1	0	2
	CP	1	0	0	0
	DPS	1	1	1	8
	Excision	0	0	0	1

SCN – Serous cystic neoplasms, MCN – Mucinous cystic neoplasms, IPMN – Intraductal papillary mucinous neoplasms, SPT – Solid pseudopapillary tumour, PD – Pancreaticoduodenectomy, CP – Central pancreatectomy, DPS – Distal pancreaticosplenectomy

Most common cystic neoplasms in our series is solid pseudopapillary neoplasms(Figure 2) (SPN – 55%) followed by serous cystic neoplasms(Figure 3) (SCN – 30%), Mucinous cystic neoplasms (MCN – 10%)(Figure 4) and main duct Intraductal papillary mucinous neoplasms in one patient(Figure 5) (MD IPMN – 5%).

Figure 2: CECT showing Solid Pseudopapillary Tumour Pancreas (Encapsulated mass in head with peripheral calcification)

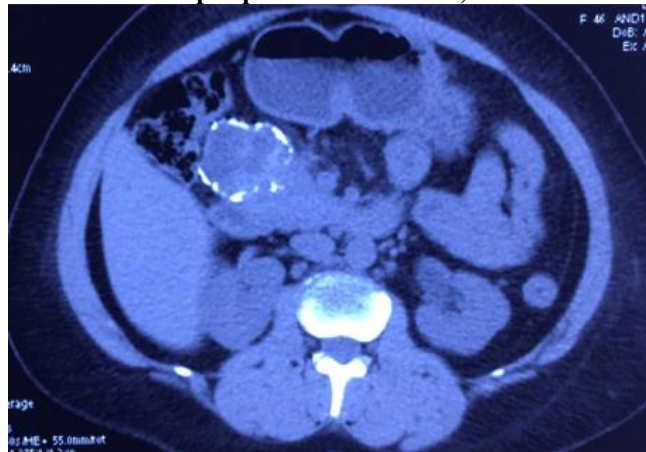


Figure 3: CECT showing Serous cystic neoplasm (SCN)

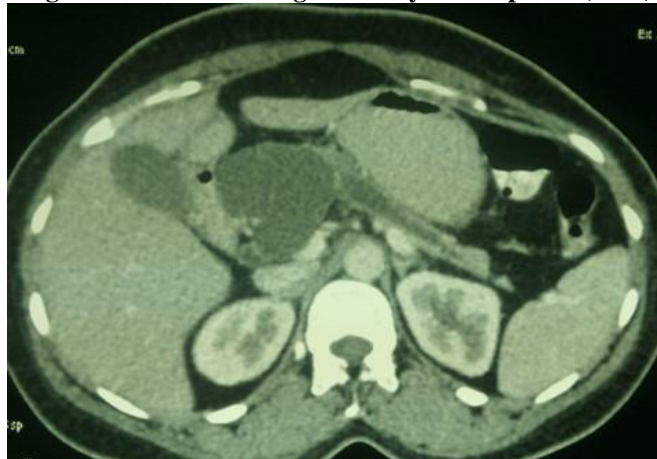


Figure 4: CECT showing Mucinous Cystic Neoplasm of Pancreas

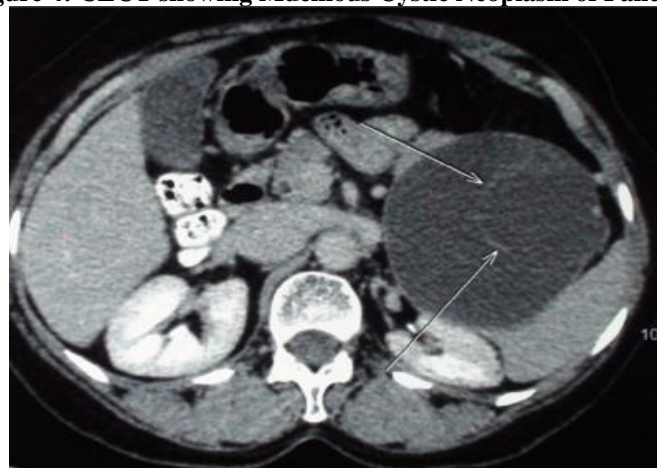
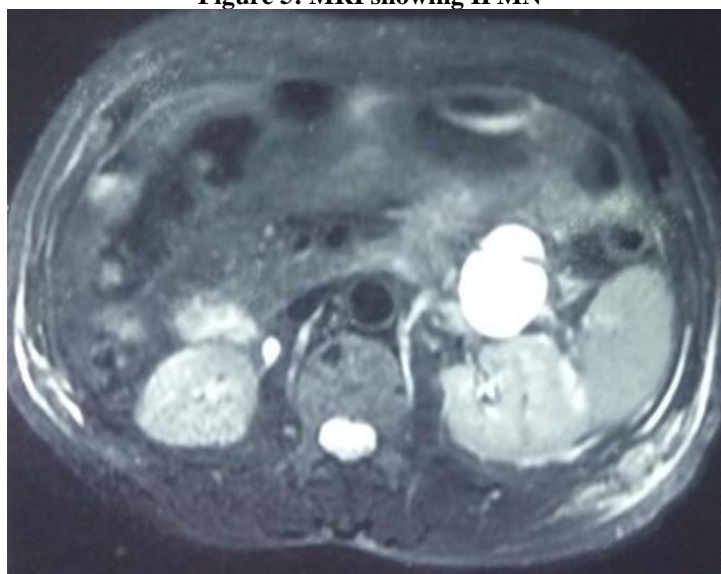


Figure 5: MRI showing IPMN



Among 20 patients, two patients died in the post operative period. Both of them had underwent pancreaticoduodenectomy. One patient was a case of solid pseudopapillary neoplasm of pancreatic head with involvement of portal vein, who after pancreaticoduodenectomy (Figure 6) with portal vein resection and reconstruction, died on post operative day three due to sudden cardiac arrhythmia. Second patient was a case of serous cystic neoplasm of pancreatic head who underwent pancreaticoduodenectomy, died due to Post pancreatectomy hemorrhage.

Figure 6: Whipples Specimen - Mucinous Cystic Neoplasm



Eight (40%) patients developed delayed gastric emptying (DGE). All were grade A DGE and managed conservatively. Post operative pancreatic fistula was present in seven patients (35%) and was managed conservatively. Bile leak was present in one patient who was managed conservatively. Gastric fistula occurred in a patient of distal pancreatectomy splenectomy which was managed conservatively.

All 18 patients were on a regular follow up with median follow up period of 42 months. All patients were followed up as per our protocol with clinical examination and ultrasound imaging every 6 monthly for two years with MRI done yearly. None of these patients during follow up showed any signs of recurrence in imaging.

IV. Discussion

Cystic neoplasms of pancreas are increasingly noted in recent years, which is mostly attributed to increasing diagnostic modalities available in these days⁶. The incidence of cystic lesions was reported as 2.6 per 100 individuals per year⁷. Cystic neoplasms include benign entities such as serous cystadenomas (SCAs), premalignant cysts such as intraductal papillary mucinous neoplasms (IPMNs), mucinous cystic neoplasms and cystic lesion with malignant potential such as solid pseudopapillary tumour.

Serous cystadenoma can present in either one of its two variants, one is microcystic, having a honey comb appearance (septated cysts), also they can have classic central sunburst, radial or stellate scar pattern in CT in about 30% of patients. Another variant is macrocystic, which is difficult to differentiate radiologically from mucinous pancreatic cystic neoplasms⁸. SCAs are generally benign, resection is offered if patient is symptomatic or there is a diagnostic dilemma⁹⁻¹¹. In our study there were six patients of serous cystic neoplasms who underwent surgery since they were symptomatic.

Mucinous cystic neoplasms (MCN) are almost exclusively found in middle aged females. But we reported a case of MCN in a male in our series. MCN are often unilocular, but may contain septa within, do not communicate with pancreatic duct. They also have peripheral eggshell calcifications, if there is any evidence of mural nodules in imaging, there is high chances of malignant transformation. They are more common in body and tail of pancreas⁹⁻¹³, presence of ovarian stroma is characteristic of these tumours, malignancy risk ranges from 10% to 17%⁸, On diagnosis of MCNs surgical resection is warranted due to its malignant potential¹²⁻¹⁵.

Intraductal Papillary mucinous neoplasms (IPMN) can be main duct IPMN, branch duct IPMN or mixed. Since main duct IPMN and mixed types have increased risk of malignancy they are always resected, whereas branch duct IPMNs are either observed or resected based on International consensus guidelines 2012 (Fukuoka guidelines) for the management of IPMN¹⁴⁻¹⁶. Main duct and mixed IPMN has a malignancy risk in the range of 38 to 68%. Branch duct IPMN has a malignancy risk⁸ in the range of 12% to 47%. We reported a case in our series which was diagnosed after HPE examination of distal pancreatectomy, which was done for Left pancreaticopleural fistula.

Solid Pseudopapillary tumours (SPT) are very unique, as they are common in young females as opposed to other cystic neoplastic lesions which are common only after 50 years. These lesions are well demarcated, have both solid and cystic areas. Histological examination shows polygonal epithelial cells arranged in a discohesive pattern, immunohistochemical staining for vimentin, CD 10, keratin, neuron specific enolase is positive¹⁷, it shows abnormal β -catenin expression in contrast to ductal adenocarcinoma. Liver or nodal metastasis, vascular invasion are signs of malignant disease. It presents as a metastatic disease in about 15% of patients. Cross-sectional imaging characteristically reveals encapsulated lesions with irregular areas of hypodensity secondary to necrosis or haemorrhage¹³⁻¹⁵. They have the potential to invade, metastasize or recur in 8% to 20% of cases⁸. Since SPTs have a low malignant potential and they should be removed. In our series SPTs were the commonest lesions diagnosed.

V. Conclusion

Most patients with cystic neoplasms of pancreas are asymptomatic, but they can present with abdominal pain or mass, weight loss, jaundice, back pain or steatorrhea⁸. All our patients were symptomatic at the time of diagnosis. Imaging modalities commonly used for detection and planning treatment are CECT and MRI abdomen. EUS guided FNA is helpful in doubtful lesions. Surgical treatment is the standard of care for these lesions.

Declarations

Ethical consideration if any

None

Ethical approval and consent to participate

Obtained

Consent

Written informed consent was obtained from all patients for publication of this study and any accompanying images.

Availability of data and material

Everyone

Competing interests

No competing interest to the article

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