

Chapter 5

A Singular Case of Adenomyoma of Ampulla with Parathyroid Adenoma - A Rarest of Rare Association

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Abstract

Adenomyoma is an uncommon benign lesion, rare in the extrahepatic biliary tree and ampulla of Vater, but relatively more common in the gallbladder. Preoperative diagnosis of ampullary adenomyoma is highly challenging, as it often mimics malignancy.

We present a case report of a 58-year-old gentleman who presented with abdominal pain and obstructive jaundice to our institution and underwent standard pancreaticoduodenectomy for suspected periampullary malignancy. Surprisingly, the biopsy revealed adenomyoma of the ampulla. Postoperatively, he developed symptoms of hypercalcemia, which, upon further evaluation, was due to a hyperfunctioning left parathyroid adenoma that was subsequently surgically removed.

The coexistence of adenomyoma of the ampulla and parathyroid adenoma is exceedingly rare and has not been reported in the literature to the best of our knowledge. We present this unique case report to highlight this singular association, hoping that further research in the future may shed light on this phenomenon. Serum calcium levels should be assessed in all periampullary lesions, as this simple test could have identified the parathyroid adenoma preoperatively.

Keywords: Adenomyoma Ampulla, Periampullary Malignancy, Parathyroid Adenoma, Hypercalcemia, Case Report

1. Introduction

Adenomyoma (adenomyomatous hyperplasia, adenomyomatosis or adenomyosis) is an uncommon hamartomatous benign lesion found throughout the gastrointestinal tract, more commonly in gallbladder and notably rare in common bile duct (CBD) and in ampulla of vater (AOV) [1]. Adenomyoma of the AOV is clinically significant as it causes obstructive jaundice, mimicking adenocarcinoma of the AOV or distal CBD. Despite being a benign lesion they are mostly treated with major surgical resection with high morbidity, as preoperative diagnosis is extremely challenging.

We report a case of a 58 year old gentleman with adenomyoma ampulla who was treated with standard pancreaticoduodenectomy (PD) without any major post operative surgical complications. Surprisingly, the patient developed complications from hypercalcemia, caused by a newly detected parathyroid adenoma. This case report highlights both the rarity and diagnostic challenge of adenomyoma of the AOV, as well as the fact that its co- existence with parathyroid adenoma has not yet been reported in the literature.

2. Case Presentation

A 58-year-old male patient with no comorbidities presented to our institution with complaints of upper abdominal pain for 2 months and yellowish discolouration of eyes for 2 weeks. He had no history of colicky flank pain, bony pain, polyuria, psychosis or any other neuro

psychiatric symptoms. There was no family history of any malignancies. Laboratory workup showed a deranged obstructive pattern liver function test with total bilirubin of 3.4 mg/dl, direct bilirubin of 2.8 mg/dl, alkaline phosphatase (ALP) of 330 U/L and normal alanine transaminase (ALT) and aspartate transaminase (AST). Complete blood count was normal, with no elevation of acute phase reactants and a normal amylase level. Cancer antigen 19-9 (CA 19-9) and carcinoembryonic antigen (CEA) were normal. Abdominal contrast enhanced computed tomography (CECT) scan showed a heterogeneously enhancing soft tissue lesion of size $1.5 \times 1.4 \times 1.3$ cm, located in the ampullary region with upstream dilation of CBD of 30 mm and intrahepatic biliary radicles dilation (IHBRD) and dilated main pancreatic duct of 4 mm Figure 1. There was also an incidentally detected right kidney upper pole microlith. Upper gastrointestinal (GI) scope revealed bulging of ampulla with normal mucosa Figure 2. Biopsy was not performed since a negative or inconclusive biopsy would not change the treatment plan of the patient as suspicion of malignancy was high.

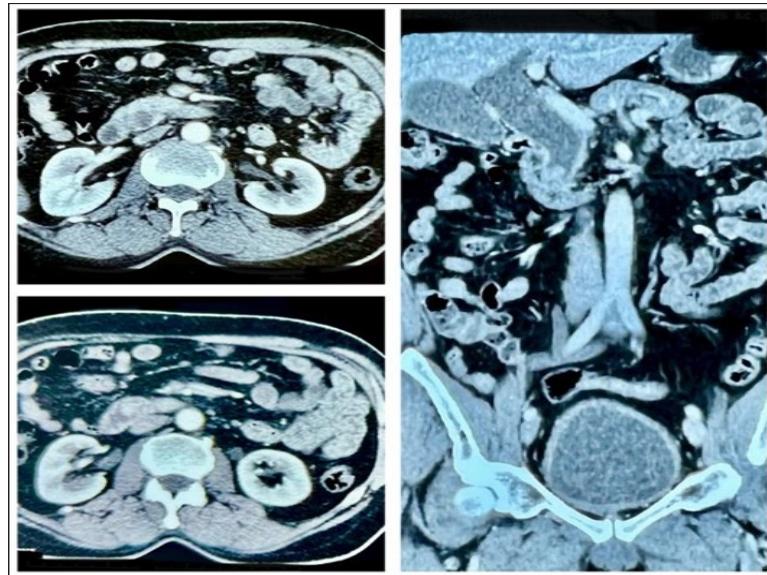


Figure 1: Axial and coronal view of computed tomography shows enhancing lesion in ampulla with dilated common bile duct

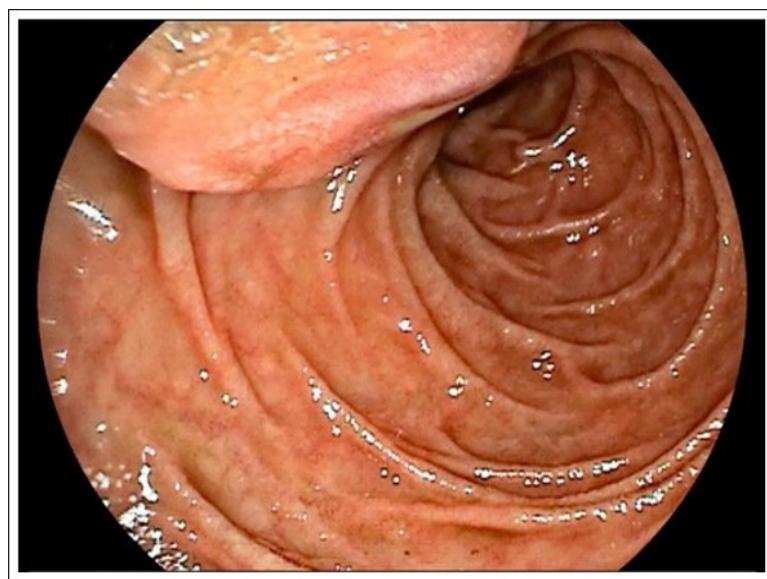


Figure 2: Esophagogastroduodenoscopy showing bulging of ampullary region with normal mucosa covering it

This case was reviewed in a multidisciplinary gastrointestinal (GI) oncology meeting, and after discussion with the patient, an open standard pancreaticoduodenectomy (PD) was performed Figure 3. He had a smooth post operative course with no major complications. The resected specimen showed $1.5 \times 1.5 \times 1$ cm nodule at the ampulla that on microscope showed a well circumscribed nodular proliferation of ducts, glands and smooth muscle cells in a disorganized pattern diagnostic of adenomyoma of ampulla Figure 4.

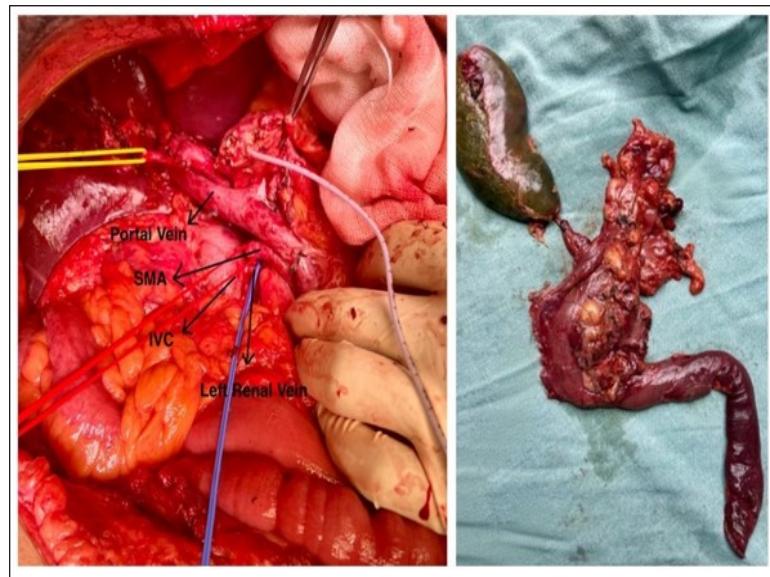


Figure 3: Intraoperative image showing vascular structures after Pancreaticoduodenectomy (Left) and Standard Pancreaticoduodenectomy Specimen (Right).
SMA – Superior Mesenteric Artery, IVC – Inferior Vena Cava

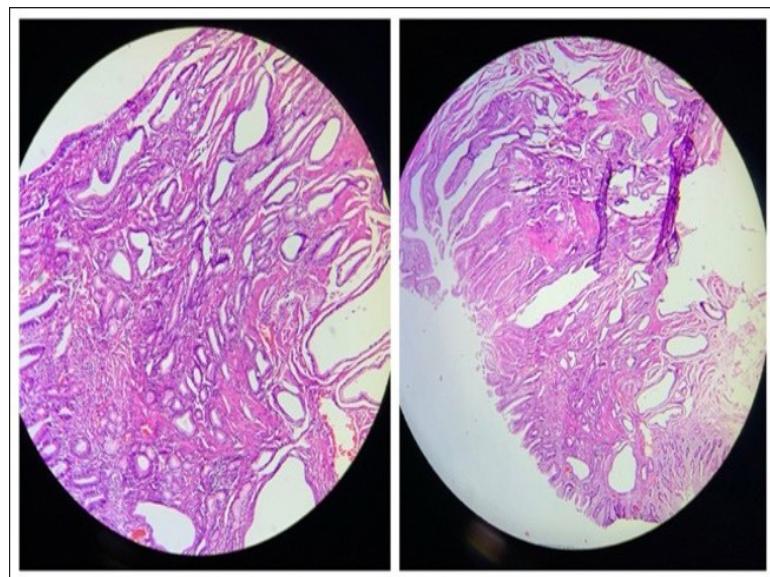


Figure 4: Histopathological imaging - hematoxylin and eosin staining shows nodular proliferation of ducts, glands and smooth muscle cells in a disorganized pattern without any atypia or mitosis, suggestive of adenomyoma of ampulla

On post operative day (POD) 7 patient was irritable, talking irrelevantly and developed mild slurring of speech. On evaluation he was found to have severe hypercalcemia (total serum calcium of 15.8 mg/dl) and on further investigation, was found to have primary hyperparathyroidism (increased serum parathyroid hormone levels of 663 pg/ml; normal range 10-65 pg/ml). Ultrasonography of the neck revealed a well-defined lesion of $3 \times 3 \times 1.6$ cm in the left parathyroid region. Endocrinology consultation was done, and he was evaluated for associated Multiple endocrine neoplasia (MEN) syndrome. Magnetic resonance imaging (MRI) brain was normal with normal prolactin, growth hormone levels and normal thyroid function test. He was found to have none of the associated features of MEN syndrome. Technetium-99m Sestamibi (MIBI - methoxy isobutyl isonitrile) parathyroid scan and MIBI- pertechnetate subtraction study confirmed the diagnosis of left parathyroid adenoma Figure 5 a). After optimizing the patient, surgery to remove the left parathyroid adenoma was done, and biopsy confirmed the same Figure 5 b,c,d). He was discharged in stable condition, and he is symptom free and on regular follow up for the last 8 months.

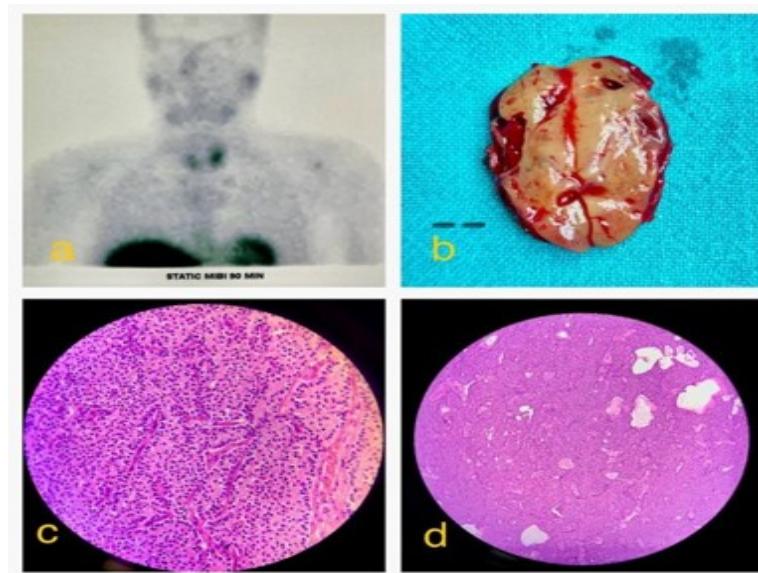


Figure 5: 5a - Sestamibi scan showing increased tracer uptake in left parathyroid region with persistent hold up till delayed images. 5b - Cut open specimen of left parathyroid adenoma. 5c (40x Magnification) and 5d (10x Magnification)-hematoxylin and eosin-stained microscopy images shows a benign neoplasm composed of chief cells with granular cytoplasm and round vesicular nucleus admixed with areas of hemorrhage and cystic change, consistent with parathyroid adenoma.

Table 1: Timeline

| Day | Events |
|-----|--|
| 0 | Patient presented to the hospital with abdominal pain and yellowish discoloration of eyes |
| 5 | Multidisciplinary GI oncology meeting – suspected periampullary malignancy and final decision for surgery made |
| 7 | Open standard pancreaticoduodenectomy surgery was done with no major complications |
| 14 | POD 7 – he was irritable and talking irrelevantly |
| 17 | Sestamibi scan confirmed the diagnosis of left parathyroid adenoma |
| 19 | Left parathyroidectomy was done |
| 23 | Patient discharged in stable condition |

3. Discussion

Adenomyomas are defined as duct-like structures with hyperplasia of smooth muscle cells, combining both epithelial and mesenchymal elements [2]. Adenomyoma is relatively more common in gallbladder and extremely rare in AOV with less than 60 cases being described in indexed literature so far, reported mostly as single case reports [3, 4]. The exact histogenesis of adenomyoma in AOV is still unknown with two common hypotheses attributing to their origin. One states that chronic inflammation of papilla causes both muscular and adenomyomatous hyperplasia while the other one hypothesizes that these lesions might be incomplete heterotopic pancreatic tissue [5].

Preoperative diagnosis of adenomyoma of AOV is highly challenging as its presentation mimics that of periampullary malignancy. Radiological imaging (CECT, MRI, MRCP) doesn't reliably differentiate them, as both appear as tumor like mass in ampullary region with upstream biliary dilatation [3]. Diagnosis is confirmed only by histological examination, which is not always possible on endoscopic biopsies as overall accuracy is low [6]. Menzel et al in their prospective study of 40 patients with papilla of vater tumors, concluded that in case of enlarged or suspicious papillae, endoscopic biopsies from both deep and superficial layers following sphincterotomy should be obtained to improve diagnostic accuracy. In a 10-year retrospective study by Gamble et al. of AOV biopsy specimens from 252 patients, many benign ampullary biopsies were later found to be malignant upon resection, indicating that a negative endoscopic biopsy does not rule out malignancy in ampullary lesions [7]. In our patient this is the reason we didn't proceed with endoscopic biopsy and directly went ahead with PD surgery. Although a few reports suggest that endoscopic papillectomy or surgical ampullectomy is sufficient for these benign ampullary lesions, most patients undergo Whipple procedure and are diagnosed definitively as adenomyoma only after the final biopsy [4] Table 2 . Choosing the appropriate treatment in these cases is highly challenging, because both radiology and endoscopy often cannot accurately distinguish between benign and malignant ampullary lesions as shown in the below Table 2 in reference [3, 5, 8–11].

Serum calcium levels are not routinely checked in the preoperative evaluation of these patients if kidney function tests are normal, particularly in resource-limited settings like the Indian subcontinent. Our patient is unique in that he had no symptoms of hypercalcemia preoperatively but developed them post-surgery. An incidental CECT finding of a right kidney microlith, was not further evaluated as the patient was asymptomatic. In retrospect, assessing this asymptomatic microlith with serum calcium levels could have led to a preoperative diagnosis of the parathyroid adenoma, potentially reducing overall morbidity.

Association of hyperfunctioning parathyroid adenoma with ampullary lesions is very rare, although association with Gastro- Enteropancreatic (GEP) neuroendocrine tumor is reported in MEN type 1 syndrome [12]. Our patient had a normal MRI brain and pituitary

hormone levels with negative GEP neuroendocrine workup. Despite extensive literature search, the association of adenomyoma of ampulla with a hyperfunctioning parathyroid adenoma has not yet been reported and further research might be needed to shed some light on this unique association.

Table 2: Literary Review of Similar Case Reports of Adenomyoma of Ampulla

| Authors | Age /Sex | Clinical presentation | LFT | Imaging/ Endoscopy | Preoperative biopsy | Treatment |
|----------|----------|--|---|---|---|-------------------------------|
| [8] | 61/M | Upper abdominal pain | Obstructive pattern (elevated direct bilirubin and ALP) | CT: acute pancreatitis with dilatation of CBD and dilated pancreatic duct. EUS: multilobulated hypoechoic ampillary density (2.4 x 2.1 cm). | EUS-FNA: reactive cells. Endoscopic biopsies: inflammatory polyp versus inflammatory changes | Endoscopic ampullectomy |
| [9] | 42/M | Jaundice and upper abdominal pain | Obstructive pattern | CT: abrupt narrowing of the distal CBD and proximal biliary dilatation | Endobiliary biopsies: chronic inflammation with fibrosis and dysplastic change | PD |
| [5] | 73/F | Jaundice | Obstructive pattern | MRCP: stenosis of the distal CBD at ampillary level, with dilatation above this region. EUS: retro-ampillary mass. | Endoscopic biopsies: atypical cells and chronic inflammation without dysplasia | PD |
| [3] | 58/M | Upper abdominal pain | Mildly elevated transaminases with normal bilirubin and ALP | Endoscopy: bulging papilla. EUS: mass in the ampillary region. | EUS-FNA: epithelial cell groups, some with benign characteristics, others in favour of epithelial dysplasia | PD |
| [10] | 74/F | Incidentally detected for evaluation of renal colic pain | Normal | CT: nodular lesion in distal CBD with proximal biliary dilation and dilated MPD and left renal tumor. MRCP: ampillary mass causing bicanalicular obstruction. | Not done | PPPD with partial nephrectomy |
| [11] | 47/F | Abdominal pain | Obstructive pattern | CT: mild extrahepatic biliary dilation with diffuse wall thickening and smooth distal CBD tapering. | Endoscopic biopsy: chronic inflammation with no atypical cells | PPPD |
| Our case | 58/M | Upper abdominal pain and jaundice | Obstructive pattern | CT: ampillary mass with proximal biliary dilation and dilated MPD with right kidney microlith. | Not done | PD |

4. Conclusion

Adenomyomas of the AOV and distal CBD are rare benign lesions, typically diagnosed through postoperative biopsies, as they often mimic malignant neoplasms and rarely receive a definitive preoperative diagnosis from radiology or endoscopy. There are currently no established guidelines or protocols for evaluating and managing this condition. Urgent research is needed to implement newer techniques, such as EUS, immunohistochemistry (IHC), and advancements in frozen sections and pathology, to improve diagnostics and enhance patient outcomes.

Serum calcium levels should be assessed in all periampillary lesions, as this simple test could have identified the parathyroid adenoma preoperatively, especially given the patient's kidney microliths. This case highlights the importance of thoroughly evaluating even minor incidental findings before major resections, even if the patient is asymptomatic.

Abbreviations

CBD- Common Bile Duct

AOV- Ampulla of Vater

PD - Pancreaticoduodenectomy

CECT - Contrast Enhanced Computed Tomography

POD - Post Operative Day

MEN - Multiple Endocrine Neoplasia

MRI - Magnetic Resonance Imaging

MRCP - Magnetic Resonance Cholangiopancreatography

EUS - Endoscopic Ultrasound

LFT- Liver Function Test

CT- Computed Tomography

CBD- Common Bile Duct

EUS- Endoscopic Ultrasound

FNA- Fine Needle Aspiration

PD- Pancreaticoduodenectomy

MRCP- Magnetic Resonance Cholangiopancreatography

ALP- Alkaline Phosphatase

MPD- Main Pancreatic Duct

PPPD- Pylorus Preserving Pancreaticoduodenectomy

Article Information

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