Acta Scientific Women's Health (ISSN: 2582-3205)

Volume 6 Issue 9 September 2024

Research Article

MDCT Evaluation of Colonic Malignant Villous Tumors

Yashaswini Basaboina, Rohini Avansta*, Abishek D and Abhimanyu B Punja

Department of Radiodiagnosis, K.S. Hegde Medical Academy, India

***Corresponding Author:** Rohini Avansta, Department of Radiodiagnosis, K.S. Hegde Medical Academy, India.

Received: August 20, 2024

Published: August 26, 2024

Abstract

Aims: To review and present the MDCT features of colonic villous adenomatous tumors and their features favoring malignant transformation.

Place and Duration of Study: Department of Radio-diagnosis, K.S. Hegde Medical Academy (KSHEMA), Justice K.S. Hegde Hospital, Mangalore, between August 2020 and May 2023.

Methodology: A retrospective study was performed on 11 patients (7 males and 4 females) of the age range 45-80 years who had undergone MDCT. Plain and contrast abdomen CT was done in arterial, venous, and delayed. All the patients had histopathologically proven diagnoses of colonic villous lesions and had undergone surgical resection. The CT findings and the histopathology reports were reviewed.

Results: 63% of 11 subjects had adenocarcinoma. The features of villous tumors in our study were entophytic lesions of the colon [100%), sessile (91%), solitary (82%), and cerebriform surface (82%), causing luminal occlusion (91%). Majority of them were found in the rectum (55%). In our study, the features of villous lesions favoring malignant transformation were size >2 cm (91%), irregular surface (82%), and heterogeneous enhancement pattern (73%). The other associated features favoring malignancy include perirectal extension (55%), enlarged regional lymph nodes (63%), and metastases (63%).

Conclusion: Villous adenomas are known to have a high potential for undergoing malignant transformation. Characterization and diagnosis of suspicious high-grade lesions are crucial for decision-making in management. The MDCT appearance of villous adenomas and features of malignant change is unique and pathognomonic.

Keywords: MDCT; Villous Adenomas

Introduction

Adenomas of Colon are precursors of colorectal cancer [1]. They comprise about 50% of all colon and rectum polyps, with serrated and hyperplastic lesions contributing about 33% and mucosal polyps making up 10% [3,5]. They come in three subtypes: villous, tubular, and tubulovillous adenomas [2]. Tubulovillous subtype has 25 to 75% villous architecture, while villous adenomas have more than 75% villous architecture [7]. According to the literature, villous adenoma is a rare and more aggressive type with a large size with more lobules (10 are more) compared to a tubular adenoma and has greater chances of malignant transformation [1,5]. The risk of carcinoma is related to the proportion of villous change in an adenoma [2].

Villous adenomas develop from the surface epithelium with thin intervening fibrovascular cores. Compared to normal mucosa of the colon, there is an increase in the surface area of these lesions due to the villous configuration of the epithelium. The increased epithelium-to-connective tissue ratio gives these lesions a soft and compressible quality.

Villous adenomas usually are asymptomatic but can be symptomatic due to the larger size of the lesions, which may result in unusually high mucus output, obstructive manifestations, diarrhea, and occasional rectal bleeding. Villous adenomas may produce sodium, water, and potassium, resulting in higher secretory volumes mediated by prostaglandin E. Due to a larger area of the secretory

surface, villous adenomas are related to electrolyte depletion syndrome [1].

Clinical diagnosis of these lesions is difficult due to the overlap of features. Few studies are available in the literature which described MDCT features of malignant villous tumors [2]. Even though it is noted in the literature that high- grade dysplasia and malignancy at imaging are somewhat challenging to detect [2], it is vital to detect, characterize, and determine the local extension of the lesion to plan treatment. This study aims to delineate MDCT features of colonic villous adenomatous tumors and the features favoring malignant transformation.

Materials and Methods

This is a retrospective study conducted from August 2020 to May 2023 on 11 patients who had MDCT diagnosis of malignant villous adenoma and were referred to the radiology department. The patients had clinical features of either bowel obstruction, suspected malignancy, or abdominal pain. The patients' basic demographic details and clinical diagnoses were recorded.

- **MDCT Protocol:** All subjects had undergone CT on GE evo revolution 128 slice scanner in the spiral mode in contrast-enhanced arterial, venous, and delayed phases from the dome of the diaphragm to the pelvis. 5mm thick axial sections were obtained after administering 80-110mL of non-ionic iodinated contrast (370mgI/mL) intravenously at 2-3mL/s. Negative contrast was also given. All patients had initial non-contrast CT. The images were reconstructed using multiplanar reformatted images with a slice thickness of 1.25mm and viewed in various planes. All the patients had histopathologically proven colonic villous lesions and all of them had undergone surgical resection.
- **MDCT Findings:** Location, size of the lesion, features of colon obstruction, enhancement pattern of the lesion, the surface of the lesion, type of lesion, local extension, presence of regional/distant lymph nodes, and distant metastases were recorded. Radiological features were then correlated with operative finding and histopathological diagnosis.

Results

Demographic data and clinical presentation

The distribution of males and females among 11 patients studied was 64%(7) and 36%(4), respectively. The age range of these individuals was 45-80 years. Most common presentation was non-specific lower abdominal pain (87%), followed by rectal bleeding (10%), and 3% had distension of the abdomen.

MDCT features

Most patients showed rectal involvement (55%). Other sites involved are the recto-sigmoid junction, sigmoid colon, and descending colon (Table 1).

Table 1: Site of lesions in colon.

S. n	Site of the lesion	Number	Percentage
1	Rectum	6	55
2	Sigmoid colon	1	9
3	Others	4	36
	Total	11	100
Others- include recto-sigmoid and descending colon			

In our study most of the villous tumors were solitary and showed irregular and cerebriform surface. The majority of the lesions had no pedicle compared to 9% of the pedunculated lesions. 73% of the lesions showed tuft of feeding vessels at the origin from the mucosal layer, which appeared like vascular pedicle. 91% of the lesions showed features of luminal occlusion (Table 2).

No	Feature		Percentage
1	Sessile	10	91
2	Pedunculated	1	9
3	Vascular pedicle	8	73
4	Absent vascular pedicle	3	27
5	Solitary lesion	9	82
6	Cerebriform surface	9	82
7	Polypoidal mucosal thickening	2	18
8	Luminal occlusion	10	91
9	Size of the lesion		
	<2cm	1	9
	2-5cm	7	64
	>5cm	3	27
10	Heterogenous enhancement	11	100

Table 2: Distribution of MDCT Features of villous lesions of the colon.

Most (91%) of the lesions in our study appeared to be > 2cm in size and showed irregular surfaces with heterogeneous enhancement patterns in contrast study (Table 2).

In our study, 55% of the lesions showed perirectal extension, and 63% showed metastatic extension to regional lymph nodes and distant organs. Liver was the most frequent site for distant spread and one into the lung (Table 3).

On histopathological examination most of the lesions were identified as Adenocarcinoma (63%) followed by high grade dysplasia (18%) and low grade dysplasia (18%) (Figure 1).

Discussion

Villous adenomas are precursors of colorectal cancer and account for around 10% of all adenomas of the colon. They are equal-

Particulars	Percentage
Perirectal extension	55
Enlarged regional lymph nodes	63
Metastases	63

Table 3: Associated features favouring malignancy.

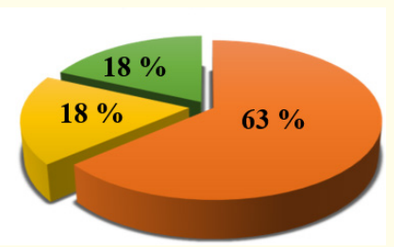

Figure 1: Histopathological diagnosis of villous lesions of the study.
Orange- Adenocarcinoma Green- Low grade dysplasia Yellow- High grade dysplasia.

ly prevalent in males and females and are usually seen in people between the ages of 50 and 80 [4,5]. In our study, the incidence in males was slightly higher than in females (7:4); and the age incidence was 45 to 80 years, matching the literature. They are usually found in the rectum and recto-sigmoid region but can occur elsewhere in the colon and gastrointestinal tract. The most common extracolonic location is the duodenum. In our study, most of the lesions were found in the rectum (55%). Other sites where they were frequent were recto-sigmoid, followed by the combination of recto-sigmoid and sigmoid colon (Table 1).

Adenomas are classified as diminutive, small, and large based on size, which is of a diameter of 1 to 5 mm, 6 to 9 mm, and ≥10 mm, respectively. Adenomas 10 mm or larger in diameter are considered advanced adenomas. Adenomas < 10 mm in size with at least 25% villous features or high grade dysplasia are also regarded as advanced adenomas [7]. These slow-growing lesions begin as benign adenomas, which can undergo malignant transformation. Villous adenomas can grow up to 10-15 cm in size while being benign. The size of polyps is significantly related to histopathologic findings and clinical characteristics [2]. In our study, the largest lesion encountered was about 12 cm and was well- differentiated adenocarcinoma. The size of the adenoma is a vital parameter to suspect the possibility of malignant transformation [1]. In our study, 91% of the lesions were > 2 cm in size (Table 2).

Villous adenomas are usually sessile but can also occur as polypoid and carpet- like lesions that cover a wider surface area [2,5]. Our study showed 91% of sessile lesions. Carpet-like lesions are flat, lobulated lesions covering a large surface area [2,5]. In our study, 18% of the lesions were of this type. Villous adenomas develop most frequently in the rectum [2] and in our study, 55% of the lesions were in the rectum (Table 1), and 82% were solitary (Table 2). Villous lesions are most often associated with luminal dilatation and occasionally lumen occlusion (Figure 3). In all the patients in our study, villous adenomas showed a convoluted gyral enhancement pattern giving a typical form of cerebriform appearance (Figure 6). This feature is because of the wrinkled surface similar to the sulcal and gyral pattern of the brain. In our study, cerebriform appearance was seen in 82% of the patients, and luminal occlusion was observed in 91% of the patients (Table 2). On barium studies, villous adenomas were described to have a sessile filling defect with a characteristic irregular mucosal pattern which was referred to as reticular, lacy, or feathery appearance because of the accumulation of barium in the interstices of the adenomas frond-like excrescences [5]. Similar appearance was noted in our study as the negative oral contrast was trapped in the villous interstices giving a corrugated appearance (Figure 6). This feature was one of the first reported findings by Smith., *et al.* [5].

In our study, 55% of the lesions showed perirectal extension (Table 2) (Figure 5). Broad-based soft tissue extensions from the lesion into the perirectal fat were more indicative of malignant change. The presence of pericolic lymph nodes was another feature associated with malignant changes. 63% of the patients in our study showed enlarged regional lymph nodes (Table 3).

Since villous adenomas are premalignant lesions, surgical removal is the treatment of choice. All patients in our study had undergone operative management followed by chemoradiation.

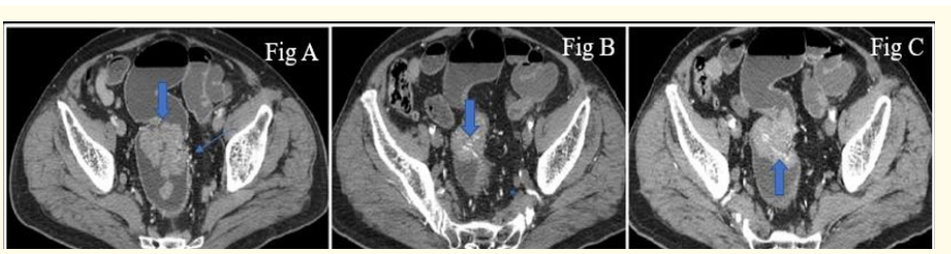

Figure 2: CT images of HPE proven Adenocarcinoma – Well differentiated. A: Axial venous phase shows an heterogeneously enhancing endophytic polypoidal lesion is distal sigmoid colon. Fig B and C: Arterial phase showing central vascular core with peripheral nodular margins.

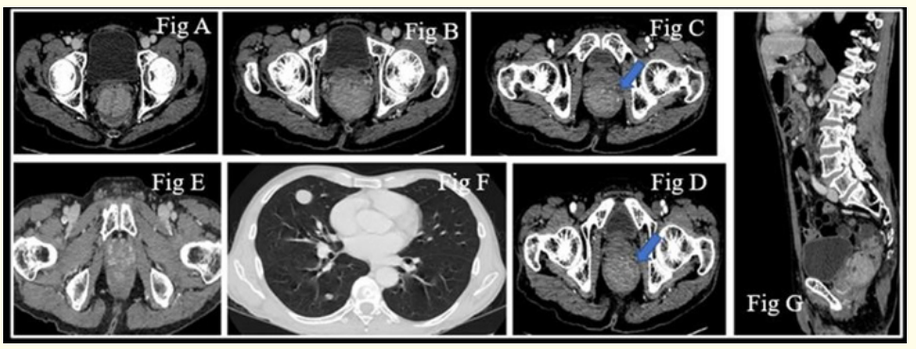

Figure 3: CT images of HPE proven Adenocarcinoma – Well differentiated. A, G: shows a heterogeneously enhancing endophytic lesion of the rectum. B: shows the thickening of mesorectal fascia. C and D show tuft of vessels in the lateral aspect of the lesion in the arterial phase. E: Shows the extension of the lesion into the anal canal. F: Lung metastases.

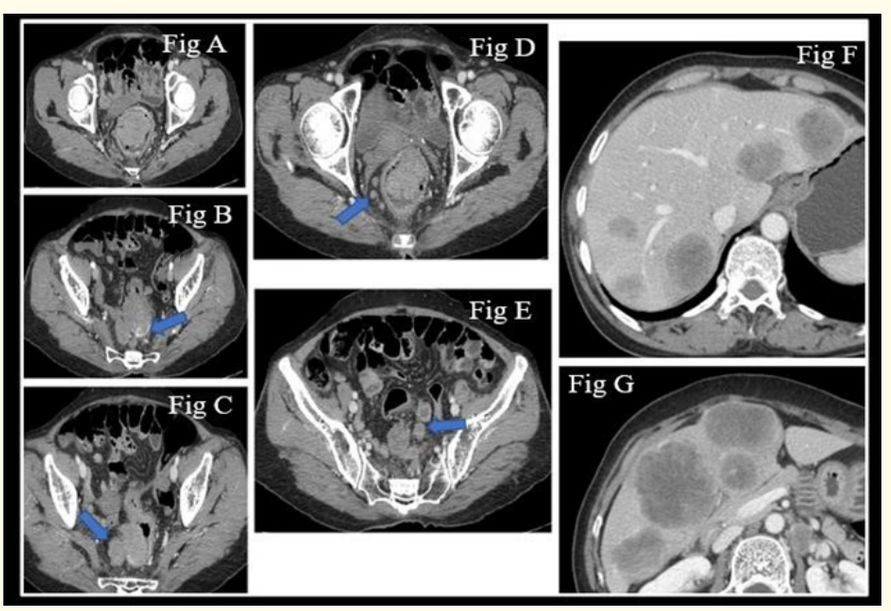

Figure 4: CT images of HPE proven Adenocarcinoma – Moderately differentiated. A: Axial venous phase shows and endophytic heterogeneously enhancing lesion in the rectum. B: Arterial phase showing vascular pedicle in the posterior aspect. C: Exophytic component of the lesion. D and E: Multiple conglomerated lymph nodes. F and G: Liver metastases.

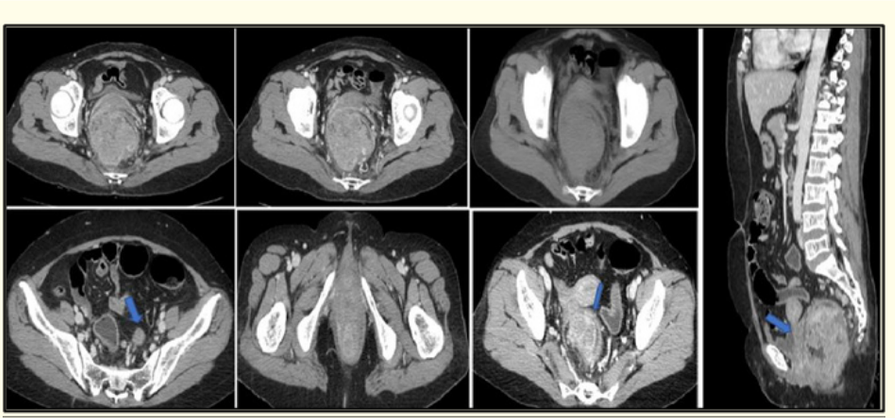

Figure 5: CT images of HPE proven Adenocarcinoma – Poorly differentiated. A: Axial venous phase shows a lobulated heterogeneously enhancing mass in the rectum causing widening of the rectum. B: Arterial phase shows vascular pedicle in posterior aspect arising from superior rectal artery. C: Plain CT image showing a soft tissue density mass. D: shows peri rectal lymph nodes E: shows extension of lesion to anal canal. F: shows perirectal fat stranding. G: shows the lesion extension to the cervix.

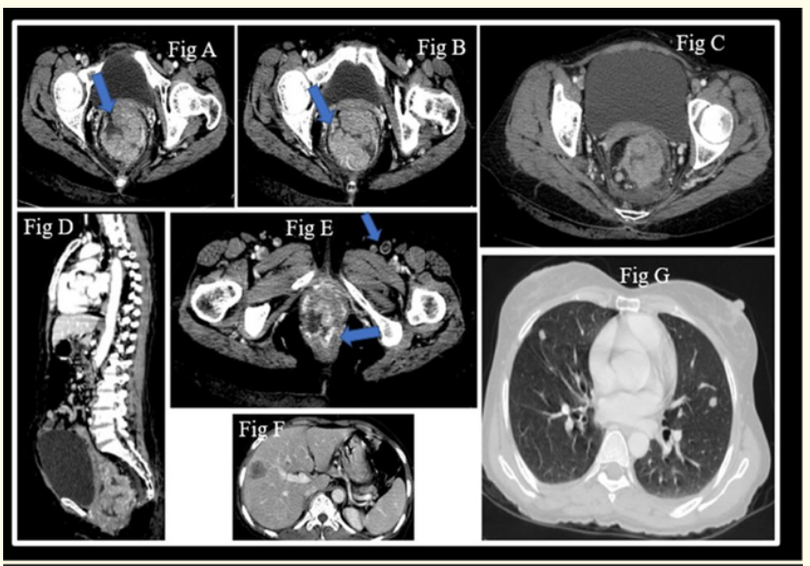

Figure 6: CT images of HPE proven Tubullovillous adenoma- high grade. A and B: Show an endophytic polypoidal lesion in the rectum with the characteristic corrugated appearance in A and cerebriform brain appearance in B. C: lesion in the rectum and anal canal. D: Similar lesion in the anal canal. E: Prominent peri rectal vessels with enlarged inguinal nodes. F: Liver Metastases. G: Lung Metastases.

Limitations of the Study

The main drawback of our study is that it is a retrospective study with a small sample size. A prospective study on a larger sample would have been better to establish the MDCT features of malignant villous tumors.

Conclusion

Villous adenomas are malignant-potential advanced lesions encountered during MDCT evaluation of the abdomen and pelvis. To help with management, it is crucial to identify these lesions and describe their extent. The MDCT appearance of villous adenomas and features of malignant change appears to be unique and pathognomonic. The MDCT features that are highly favoring villous tumors of the colon in our study were endophytic colonic lesions which show cerebriform surface or irregular convoluted appearance, which are sessile with a vascular tuft at the base, causing widening of the colon lumen with obstructive features in a patient with or without clinical suspicion. And the features highly suggestive of malignancy were local extension, regional lymph nodes and the presence of lesions in the liver/lung.

Imaging evaluation is important not only for lesion detection and characterization but for local extension before surgical excision to direct management and to decrease the incidence of adenocarcinoma. CT has an increasing role in diagnosing villous lesions even though many are detected incidentally on CT [1].

Bibliography

1. Sacks J., *et al*. "Giant villous adenoma of the sigmoid colon: an unusual cause of homogeneous, segmental bowel wall thickening". *BJR Case Report* 6.4 (2020): 20200016.

2. Lubner MG., *et al*. "Villous Gastrointestinal Tumors: Multimodality Imaging with Histopathologic Correlation". *Radiographics* 38.5 (2018): 1370-1384.

3. Vatn MH and Stalsberg H. "The prevalence of polyps of the large intestine in Oslo: an autopsy study". *Cancer* 49.4 (1982): 819-825.

4. Chung JJ., *et al*. "Large villous adenoma in rectum mimicking cerebral hemispheres". *AJR American Journal of Roentgenology* 175.5 (2000): 1465-1466.

5. Theodore R Smith., *et al*. *American Journal of Roentgenology* 177.1 (2001): 91-93.

6. Whitlow CB., *et al*. "Surgical excision of large rectal villous adenomas". *Surgical Oncology Clinics of North America* 5.3 (1996): 723-734.

7. Strum WB. "Colorectal Adenomas". *The New England Journal of Medicine* 374.11 (2016): 1065-1075.