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**Single Case**

# Granular Cell Tumor of the Ascending Colon

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**Keywords**
Granular cell tumor · Colon polyp · Pedunculated polyp · Colonoscopy

**Abstract**
Granular cell tumor (GCT) was first described by Abrikossoff in 1926. It is a mostly benign tumor with rare malignant transformation. It is defined as a soft tissue neoplasm with abundant eosinophilic cytoplasm. The mean age of diagnosis for GCT is around 45 years. It is rare for GCT to be found in the gastrointestinal (GI) tract. Within the subset of GI tract, the colon is an extremely rare site for it to be found. Franburg-Smith histopathology criteria are used to differentiate a benign from a malignant GCT. The malignant form is aggressive with high recurrence rates after resection. Histopathology and immunohistochemical stains are used to make a definitive diagnosis. Herein, we present a rare case of an ascending colon polyp that was resected and found to be a benign GCT.



## Introduction

Granular cell tumors (GCTs) are a rare soft tissue neoplasm that arises from Schwann cells. They were first described by Abrikossoff in 1926 [1]. GCTs are mesenchymal tumors consisting of the polygonal cells containing eosinophilic granular appearing cytoplasm on electron microscopy. It can be identified on pathology, as it stains positive for S-100 [2]. Even though these tumors are generally benign, 1–2% of cases have been reported as malignant [3].

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Although usually found in the oral cavity or subcutaneous tissue, 8% of cases manifest in the gastrointestinal tract. In those patients, the esophagus is the most frequently affected organ, followed by the duodenum, anus, and stomach. The least common sites are the colon and rectum [4]. To date, around 150 cases of colonic GCT have been reported in the English language literature. Most GCTs tend to be asymptomatic and less than 2 cm in size; hence, they are usually discovered incidentally during routine colonoscopy or abdominal imaging [5]. Herein we report a unique case of GCT of the ascending colon measuring 11 mm in size that was successfully resected endoscopically.

## Case Presentation

A 55-year-old male with a history of external hemorrhoids presented to the gastrointestinal clinic with constipation for 2 weeks. His previous colonoscopy 8 months prior revealed a 1-cm polyp in the ascending colon, but it was not removed due to poor preparation. Repeat colonoscopy revealed an 11-mm semi-pedunculated polyp in the ascending colon. It was hard, isolated gray-white submucosal lesion with normal overlying mucosa (shown in Fig. 1). The polyp was removed with hot snare polypectomy followed by the placement of hemostatic clips. Histopathologic examination of the resected polyp showed an intramucosal and submucosal tumor composed of polygonal cells with abundant amphophilic granular cytoplasm and centrally or eccentrically located small round or irregularly shaped nuclei (shown in Fig. 2). Margins of the resected polyp were free of tumor. Immunohistochemical analysis showed tumor cells were positive for S-100 (shown in Fig. 3), CD68, and inhibin and negative for CD117 and neurofilament. Based on the above findings, the tumor was diagnosed as GCT.

## Discussion

GCT is defined as a soft tissue neoplasm with abundant eosinophilic cytoplasm. Most lesions are benign, but malignant cases have been reported [6]. The mean age of diagnosis of GCT is around 45 years [7]. GCTs are mostly submucosal tumors, but rare cases with subserosal or intramuscular origin are also described in the literature [8]. Most of the GCTs of the colon are asymptomatic; therefore, they are usually incidentally discovered during colonoscopies performed for other indications. They appear as small, sessile, yellowish-white nodules or polyps covered by normal-appearing mucosa [9]. Endoscopic ultrasound (EUS) can be used to determine the depth of the lesion [10]. A definitive diagnosis can be made by histopathology and immunohistochemical analysis [11]. Most GCTs are thought to be neural in origin and are typically S-100 positive [12]. GCTs are commonly benign, and the Fanburg-Smith histopathological criteria are used to determine the malignant potential. These criteria include six histopathological features: necrosis, spindling, vesicular nuclei with large nucleoli, mitotic activity (at ×400 magnification >2 mitoses/10 high power field), high nuclear to cytoplasmic ratio, and pleomorphism. Neoplasms that meet three or more of these criteria are classified as histologically malignant, those that meet one or two criteria are classified as atypical, and those that display only focal pleomorphism but fulfill none of the other criteria are classified as benign [3]. The malignant form carries a mortality rate of 40% and has a high risk of recurrence [13]. Endoscopic removal is the safest and most effective treatment when feasible. Endoscopic mucosal resection can also be used, especially when suspicion of the malignant GCT is very high [10]. In our case, when colonoscopy was performed, the lesion appeared benign, and endoscopic removal was deemed appropriate. Though typically benign, gastroenterologists should be aware of malignant features such as a size greater than 4cm [3]. It is important to consider GCT when one encounters a subepithelial lesion during colonoscopy.

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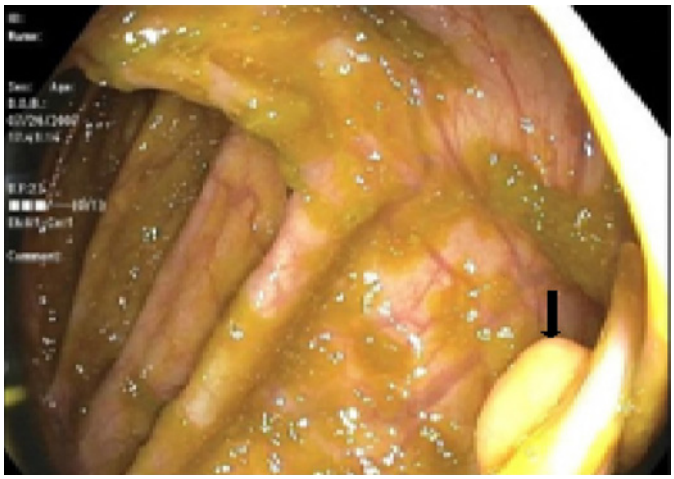

**Fig. 1.** 11-mm semi-pedunculated polyp in the ascending colon (black arrow).

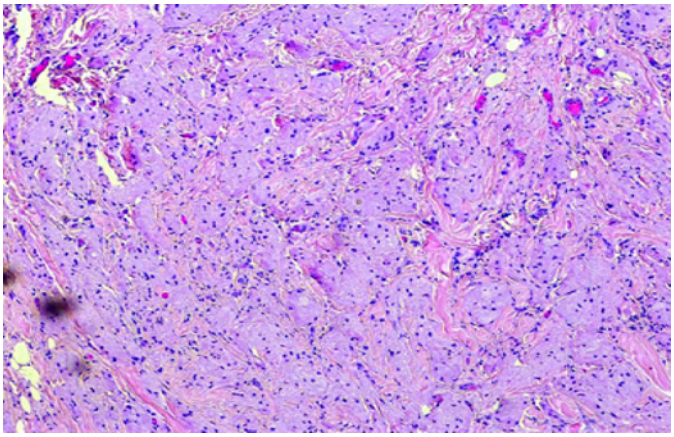

**Fig. 2.** The morphology of granular cell tumor in intramucosal and focally submucosal location in a colon polyp (H&E. ×10). Infiltrative growth pattern with nested or trabecular cellular clusters or sheets are appreciated. The cells are with abundant amphophilic granular cytoplasm and centrally or eccentrically located small round or irregularly shaped nuclei. No necrosis or mitosis is appreciated.

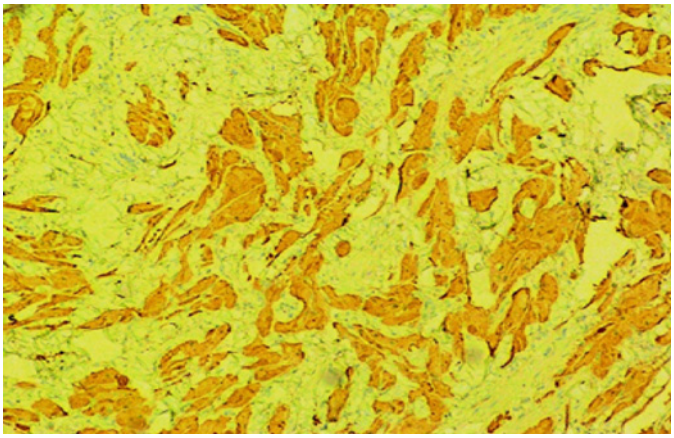

**Fig. 3.** S100 positive staining highlighted the infiltrating trabecular growth pattern of this granular cell tumor (H&E. ×10).

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*Learning Points*

Even though mostly benign, GCT is a potentially malignant tumor. Gastroenterologists need to be aware of the malignant features of GCT and allow for early diagnosis. Also, it is vital to keep GCT as a differential diagnosis for any submucosal lesion in the colon identified during colonoscopy. The CARE checklist has been completed by the authors for this case report, attached as supplementary material (for all online suppl. material, see www.karger.com/doi/10.1159/000529170).

## Statement of Ethics

This retrospective review of the patient data did not require ethical approval in accordance with local guidelines. Written informed consent was obtained from the patient for publication of the details of their medical case and any accompanying images.

## Conflict of Interest Statement

No conflicts of interest to declare.

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## Author Contributions

Dr. Samyak Dhruv wrote and edited the manuscript. Dr. Samyak Dhruv also finalized the draft. Dr. Kuldeepsinh P Atodaria, Dr. Dhineshreddy Gurala, Dr. Talal El Imad, and Dr. Jeffrey Abergel helped with editing.

## Data Availability Statement

The authors declare that the data supporting the findings of the study are available within the article. Further inquiries can be directed to the corresponding author.

## References

1 Chen Y, Chen Y, Chen X, Chen L, Liang W. Colonic granular cell tumor: report of 11 cases and management with review of the literature. Oncol Lett. 2018 Aug 1;16(2):1419–24.
2 Shrestha B, Khalid M, Gayam V, Mukhtar O, Thapa S, Mandal AK, et al. Metachronous granular cell tumor of the descending colon. Gastroenterol Res. 2018 Aug;11(4):317–20.
3 Fanburg-Smith JC, Meis-Kindblom JM, Fante R, Kindblom LG. Malignant granular cell tumor of soft tissue: diagnostic criteria and clinicopathologic correlation. Am J Surg Pathol. 1998 Jul 1;22(7):779–94.
4 Lack EE, Worsham GF, Callihan MD, Crawford BE, Klappenbach S, Rowden G, et al. Granular cell tumor: a clinicopathologic study of 110 patients. J Surg Oncol. 1980 Apr;13(4):301–16.
5 Zhang M, Sun ZQ, Zou XP. Esophageal granular cell tumor: clinical, endoscopic and histological features of 19 cases. Oncol Lett. 2014 Aug 1;8(2):551–5.
6 Bulak K, Łopuszyński W, Lutnicki K, Pomorska-Zniszczyńska A, Śmiech A, Jodłowska-Jędrych B. Granular cell tumor in a horse: multifocal pulmonary distribution and evidence of autophagy in tumorigenesis. J Equin Vet Sci. 2019 Aug 1;79:23–9.

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7 Mobarki M, Dumollard JM, Dal Col P, Camy F, Peoc'h M, Karpathiou G. Granular cell tumor a study of 42 cases and systemic review of the literature. Pathol Res Pract. 2020 Apr 1;216(4):152865.
8 Tsuchida T, Okada K, Itoi E, Sato T, Sato K. Intramuscular malignant granular cell tumor. Skeletal Radiol. 1997 Feb;26(2):116–21.
9 Sohn DK, Choi HS, Chang YS, Huh JM, Kim DH, Kim DY, et al. Granular cell tumor of colon: report of a case and review of literature. World J Gastroenterol. 2004 Aug 8;10(16):2452–4.
10 Endo S, Hirasaki S, Doi T, Endo H, Nishina T, Moriwaki T, et al. Granular cell tumor occurring in the sigmoid colon treated by endoscopic mucosal resection using a transparent cap (EMR-C). J Gastroenterol. 2003 Apr; 38(4):385–9.
11 Ramai D, Lai J, Changela K, Anand S. Colonic granular cell tumor: an endoscopic and histopathologic review with case illustration. Cureus. 2018 Jan 2;10(1):e2015.
12 Barakat M, Kar AA, Pourshahid S, Ainechi S, Lee HJ, Othman M, et al. Gastrointestinal and biliary granular cell tumor: diagnosis and management. Ann Gastroenterol. 2018 Jul;31(4):439–47.
13 Rekhi B, Jambhekar NA. Morphologic spectrum, immunohistochemical analysis, and clinical features of a series of granular cell tumors of soft tissues: a study from a tertiary referral cancer center. Ann Diagn Pathol. 2010 Jun 1;14(3):162–7.