Mucosal Schwann Cell Hamartoma Mimicking a Colon Polyp: Pathologic Insights

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A rectal polyp is found during a routine colonoscopy of a 34-year-old male. He has no known significant family history of inherited disorder. Endoscopic findings reveal a 5-mm JNET 2A polyp in the rectum which is removed via forceps polypectomy. The microscopic examination shows a polypoid colonic mucosa with fairly circumscribed proliferation of low-grade spindle cells in the lamina propria, separating the crypts. The individual spindle cells are uniform in size with abundant eosinophilic cytoplasm. No mitotic figures, nuclear atypia, pleomorphism and necrosis are noted. Likewise, the crypts do not exhibit serrated architecture.

Immunohistochemical stain showed that the mucosal-based lesion was strongly and diffusely positive for S100 (Ventana, Roche). The spindle cells show proliferation between the normal crypts and do not form a discrete lesion, hence, in correlation with the S100 positivity, the case is signed out as mucosal Schwann cell hamartoma.

Mucosal Schwann cell hamartoma (MSCH) is a rare, benign mucosal based lesion derived from the Schwann cells.[1] The entity was first described by Gibson and Hornik in 2009. It commonly presents as an incidental polyp in the rectosigmoid during routine screening colonoscopy or endoscopic procedures performed for unrelated reasons. It has no known association with any inherited syndrome, in contrast with other mesenchymal lesions such as gastrointestinal stromal tumors and neurofibroma. Since the initial description of this entity, it has been primarily reported in the colorectum, although it can occur anywhere in the gastrointestinal mucosa and even in the gallbladder.[2] Clinically, MSCHs are asymptomatic and are found incidentally. When incidental, these are usually found in middle-aged women in the left colon. Although it is benign, the correct identification of this lesion is essential for differentiating this benign entity from other gastrointestinal mesenchymal spindle cell lesions, which may entail different prognoses and treatment approaches.[3] As of 2023, only 35 cases have been identified so far and no local case in the Philippines has been reported to date.[4]

Histologically, MSCH exhibits low-grade spindle-shaped cells with tapered nuclei which are positive for S100 protein on immunohistochemistry.[5] It typically lacks the myxoid stroma as well as nuclear atypia, mitosis and necrosis that are associated with other peripheral nerve sheath tumors.[1] Given the histomorphologic features, the main differential diagnoses for this mucosal-based spindle cell lesion include neurofibroma, perineurioma, ganglioneuroma and GIST.

Neurofibroma is a benign nerve sheath tumor composed of a mixture of Schwann cells, perineural cells and fibroblasts. In contrast to MSCH, it typically exhibits a more varied cellular composition, and it can be associated with an inherited syndrome such as Neurofibromatosis type 1.[6] On the other hand, the sporadic cases occur in middle-aged adults without gender predilection and arise most commonly in small or large intestine.[7] Histologically, it is characterized by a loose, myxoid to hyalinized stroma with interspersed collagen fibers which is described as "shredded carrots." Similar to MSCH, it is positive for S100 due to the Schwann cell component. However, the S100 positivity seen in neurofibroma is not as diffuse as MSCH since the former is composed of a mixture of cells. Neurofibroma is positive for CD34, which is less commonly seen in MSCH.[8]

Another differential diagnosis is perineurioma which is a benign neural tumor characterized by perineural cell proliferation. It is clinically asymptomatic and is discovered incidentally during screening colonoscopy. It usually occurs in middle-aged adults with female predominance. The most common site is the rectosigmoid colon.[9] Microscopically, it exhibits elongated spindle cells which are arranged in a storiform pattern, and which expand the lamina propria. A characteristic feature is the uniform entrapment or whirling of the spindle cells around the crypts. Colorectal mucosal perineurioma is also often seen associated with serrated epithelial polyps such as hyperplastic polyps and sessile serrated lesions.[10] Immunohistochemically, the spindle cells are positive for EMA which highlights the delicate staining pattern of the cell processes.[11] Other immunohistochemical stains which may be utilized include Claudin-1 and GLUT1, both of which, however, are not widely available in our local setting.

The third differential diagnosis is ganglioneuroma which is a benign neoplasm composed of mature ganglion cells, Schwann cells and nerves.[9] It has a wide age range and there is no gender predilection. It typically presents as small mucosal polyps on the left side of the colon and the rectum.[9] Majority of the cases are sporadic but when the presentation is that of multiple lesions, a strong association with multiple endocrine neoplasia type 2B (MEN 2b) and neurofibromatosis type 1 is noted.[12] Histologically, it displays a mixture of mature ganglion cells, spindled Schwann cells and eosinophils within the lamina propria, which is different from the pure Schwann cell composition of MSCH. The use of S100 can delineate the mixture of the Schwannian cells and ganglion cells since the former are S100 diffusely positive but the latter cells are negative.[5]

Gastrointestinal stromal tumor is a mesenchymal neoplasm with differentiation towards the interstitial cells of Cajal.[13] More than half of the cases arise in the stomach and approximately 5% occur in the colorectal site.[14] Smaller GISTs are detected incidentally during routine endoscopy. Histologically, it can exhibit a spindle cell, epithelioid or mixed morphology. Immunohistochemically, it is characterized by positivity with CD117 and DOG1. Spindle cell type of GISTs can express CD34 and a minority can also express SMA.[15]

In our case, the main differential diagnosis is neurofibroma due to its spindle cell morphology and S100 expression

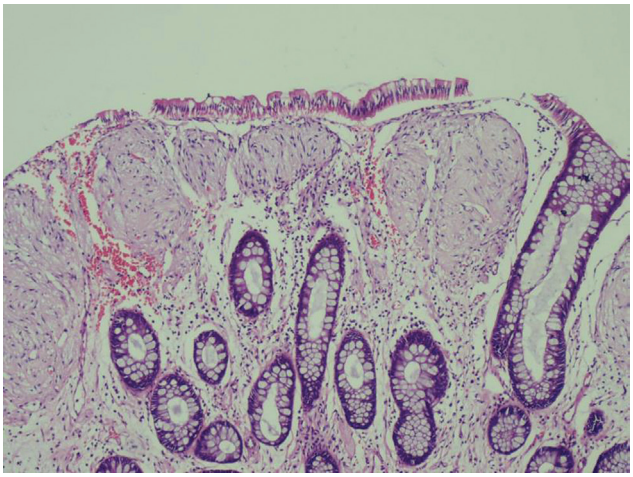

Figure 1. Microsections show polypoid colonic tissue with mucosal-based spindle cell proliferation that is dissecting in between the colonic crypts. The individual spindle cells are uniform in size without cellular atypia, mitosis, and necrosis. There are no associated crypt luminal serrations or distortion (H&E stain, 100x).

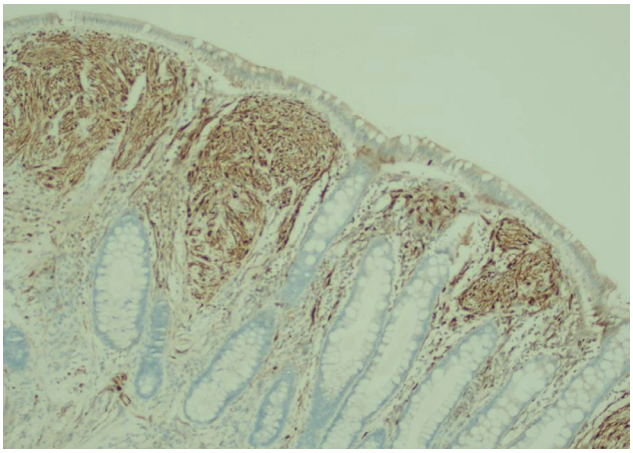

Figure 2. Diffuse and strong nuclear and cytoplasmic staining for S100 in the benign spindle cells (S100, 100x).

(Figure 2). However, the absence of clinical features of NF1, and lack of CD34 positivity has made this entity less likely in our case (Figure 3). The lack of serration of the colonic crypts and the absence of EMA expression rules out perineurioma (Figure 4). Similarly, the absence of mature ganglion cells has excluded ganglioneuroma. Lastly, the lack of CD117 and DOG1 staining dissuades GIST (Figure 5). The final diagnosis of MSCH (Figure 1) is rendered based on the following: uniform spindle cell morphology, absence of cellular atypia and mitosis, confinement to the mucosa, and strong S100 protein expression.

MSCH in the colorectum usually presents as a small polyp (mean = 5 mm) found incidentally in colonoscopy and it is predominantly located in the rectosigmoid. Similar to the other reported cases of MSCH, our case presents as a small polyp (5 mm) located in the rectosigmoid area. Although the majority of the cases are asymptomatic, a few of the MSCH can present as lower gastrointestinal bleeding or occult blood in the stool. This is like our case which

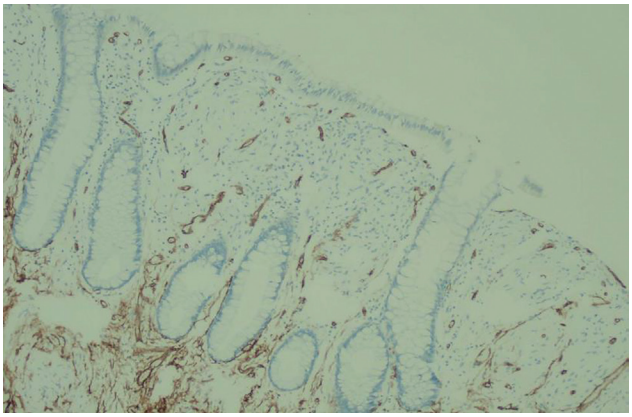

Figure 3. No membranous staining for CD34 is noted in cells of interest (CD34, 100x).

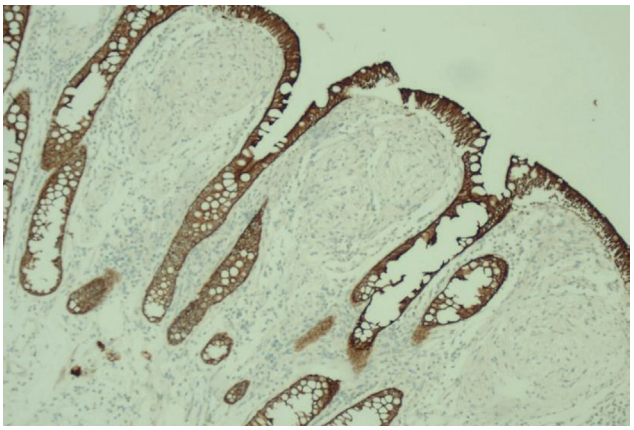

Figure 4. No membranous staining for EMA is noted in cells of interest (EMA, 100x).

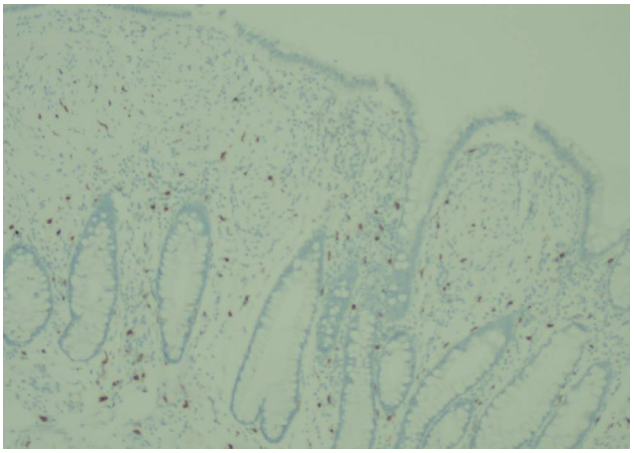

Figure 5. No membranous or cytoplasmic staining for CD117 is noted in cells of interest (CD117, 100x).

clinically presents rectal bleeding. Majority of MSCH cases have a female predilection with a mean age of 62 years old (range 46-88).[4]

This case highlights the importance of histopathological and immunohistochemical evaluation to distinguish MSCH from other spindle cell lesions of the gastrointestinal tract. Even though MSCHs are benign lesions which generally require no further treatment after excision, other mesenchymal neoplasms such as neurofibroma and ganglioneuroma may need additional surveillance or intervention, particularly if the clinical history shows stigma for systemic syndromes. On the other hand, GISTs have the potential for malignancy, hence a different treatment algorithm such as surgical resection, closer follow-up and possibly targeted therapy may be performed. Awareness and understanding of MSCH will help practicing pathologists arrive at the correct diagnosis to guide clinical management.

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ETHICAL CONSIDERATION

The authors confirm that due diligence was done in attempting to obtain informed consent from the patient involved in the case report. Despite efforts to contact the patient through different means (checking available addresses and contact via known cell phone and landline number), no response was received. In line with this, the authors ensured that all identifying information had been anonymized to protect the patient's privacy.

STATEMENT OF AUTHORSHIP

All authors certified fulfillment of ICMJE authorship criteria.

AUTHOR DISCLOSURE

The authors declared no conflict of interest.

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