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TITLE OF CASE

Atypical tumour-like involvement of the colon in Henoch-Schonlein purpura successfully treated with the administration of factor XIII

AUTHORS OF CASE ***Please indicate corresponding author by *(after the author's name)***

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SUMMARY ***Up to 150 words summarising the case presentation and outcome***

Henoch-Schönlein purpura (HSP) is a type of systemic vasculitis of the small vessels, which frequently involves the skin, kidney and gastrointestinal tract. While the typical intestinal features of HSP include diffuse mucosal redness, small ring-like petechiae and haemorrhagic erosions, tumour-like lesions are rarely observed. The current study presents a rare case of HSP with an intestinal tumour-like lesion in the cecum. The intestinal lesion caused fresh melena, and was completely resolved with the administration of Factor XIII as described in previously reported cases. It is important to immediately the proper treatment for improving tumour-like lesions which may cause severe complications, such as excessive haemorrhage and stricture.

BACKGROUND ***Why you think this case is important – why you decided to write it up***

Henoch-Schönlein purpura (HSP) is a type of systemic vasculitis of the small vessels, whose etiology is still unclear but is associated with infections, medications, vaccination, tumours, alpha-1-antitrypsin deficiency and Familial Mediterranean Fever **(1)**. The characteristic symptoms and signs of HSP include a palpable purpuric rash, abdominal pain, arthralgia and nephritis **(2)**. GI involvement is an important clue for the diagnosis of typical and atypical HSP in which gastrointestinal lesions occur before or without the skin rash **(3, 4)**. Common GI lesions have been described as diffuse mucosal redness, small ring-like petechiae and haemorrhagic erosions, which are predominantly located in the small intestine **(5, 6)**. However, few atypical lesions resembling a solid submucosal tumour have so far been described in patients presenting

with HSP in the intestine, and it is also thought to be one of the causes of intractable bleeding and the later occurrence of stricture in the GI tract **(7, 8)**.

For the treatment of HSP, acetaminophen, nonsteroidal anti-inflammatory drugs and steroids are frequently utilized **(9)**, and subsequently immunomodulators are indicated if steroids alone is refractory **(10)**. In addition, Factor XIII administration has been proposed as an adjunctive therapy when other modalities are found to not be effective, since Factor XIII levels are found to be low in HSP patients because of the local consumption of clotting factors **(11, 12)**. This report presents a case of HSP developing a large submucosal tumour-like lesion in the colon, which was cured shortly after the administration of factor XIII.

CASE PRESENTATION ***Presenting features, medical/social/family history***

A 22-year-old male visited our hospital due to a 2-week history of upper abdominal pain in January 2010. He also developed a pruritic rash which progressed proximally from both thighs to the feet since approximately 10 days before presentation **(Figure 1A, B)**. A blood examination revealed a high number of white blood cells (16040/μl; 70.05 of neutrophil, 18.1% of lymphocyte, 9.1% of monocyte, 0.3% of basophil and 1.0% of eosinophil), a high level of C reactive protein (6.36 mg/dl) and a low level of Factor XIII (41%). The peripheral hemoglobin levels (14.0 g/dl), % prothrombin time (78%), activated partial thromboplastin time (34.9 seconds), and the number of peripheral platelets were all within the normal ranges **(Table 1)**. Gastroduodenoscopy was performed after obtaining the patient's written informed consent to determine the cause of the upper abdominal pain. The examination detected multiple erosions and irregular-shaped ulcerations, which corresponded to the typical lesions of HSP, in the bulbus to the third portion of the duodenum **(Figure 2A, B)**. Conversely, colonoscopy detected a 2 cm-sized tumour-like lesion in the cecum **(Figure 2C)**. The lesion revealed a rounded elevation with a smooth edge and deep irregular ulceration in the centre, altering the typical intestinal findings of HSP. Although histological specimens obtained from the duodenum and the tumour-like lesion of the cecum revealed the infiltration of neutrophils, eosinophils and lymphocytes without vasculitis, he was diagnosed to have HSP because of the palpable purpuric rash and the abdominal symptoms with typical GI involvement **(13)**. However, it remains difficult to differentially diagnose the tumour-like lesion to be a benign lesion which developed due the involvement of HSP. To eliminate the modulation of the inflammatory change due to HSP and determine whether the tumour-like lesion is a neoplasm or not, the treatment of HSP was thus started.

INVESTIGATIONS ***If relevant***

DIFFERENTIAL DIAGNOSIS ***If relevant***

The disorders that would be included in the differential diagnosis based on the atypical tumour-like lesion in this case would be: colonic neoplasms including colon cancer, malignant lymphoma, and carcinoid and gastrointestinal stromal tumours.

TREATMENT ***If relevant***

OUTCOME AND FOLLOW-UP

Steroids (40 mg) were administered for 5 days to relieve the skin and abdominal symptoms; however these symptoms thereafter again progressed and fresh melena appeared. We therefore considered standard steroid therapy not to be effective in this case, and Factor XIII was administered for 3 days. These symptoms and the GI lesions including the ulcerations and the tumour-like lesion almost completely vanished 10 days after the treatment **(Figure 2D, E, F)**. The serum level of Factor XIII was returned to a normal range and no relapse of the abdominal symptoms was observed during the follow-up period (6 months).

DISCUSSION *including very brief review of similar published cases (how many similar cases have been published?)*

This report presents a rare case of HSP which developed a submucosal tumour-like lesion in the cecum which caused the occurrence of fresh melena, was resistant to steroid treatment and therefore was cured with the administration of Factor XIII. This suggests that careful attention needs to be paid to atypical lesions such as tumour-like elevations in patients with HSP, which may cause complications such as gastrointestinal haemorrhaging. Three cases including the present case, that reported HSP with tumour-like lesions in the small and large intestine are summarized in **Table 2 (7, 8)**.

Table 2 Reported cases of HSP with tumorous lesions in the small and large intestine

Author	Age	Gender	Location	Complications	Effective Treatment	Outcome	Reference Number
Hosono K (2008)	24	M	Descending Colon	Stricture	Administration of Factor XIII	Recovered	7
Kusagawa S (2010)	59	F	Second Portion of Duodenum	Hemorrhage	Administration of Steroid	Disappeared	8
Our case	22	M	Cecum	Hemorrhage	Administration of Factor XIII	Disappeared	

The age of the patients with tumour-like lesions was from 20 to 59, and two patients were male and the other was female. The locations of the tumour-like lesions were the descending colon, second portion of duodenum and cecum. Two cases showed haemorrhage and one case developed stricture of the descending colon, thus indicating that the tumour-like lesions in the small and large intestine of the patients with HSP may cause severe complication. The effective treatments for the tumour-like lesions were the administration of Factor XIII in two cases. Factor XIII is thought to be consumed for repairing the injury of the gastrointestinal tissues and resolved by

protease released from neutrophils in HSP **(14)**. This suggests that the treatment with Factor XIII is a feasible strategy to treat such tumour-like lesions in HSP patients when the patient presents a low serum level of Factor XIII. The appropriate and immediate therapy of HSP is for preventing severe complications including haemorrhage and stricture, and eliminating such lesions. In addition, it was suggested that these lesions are related to the pathogenesis of HSP because such lesions in the intestine of all three cases were relieved after being treated for HSP. A histological specimen obtained from the tumour-like lesion showed no obvious vasculitis in the mucosal layer. While vasculitis was generally detected in the mucosal layer, several cases with inflammation and haemorrhagic necrosis in either the submucosal layer or deeper layer of the intestinal wall, in addition to the development of perforations, have been reported among the patients presenting HSP **(15)**. These findings suggest that such tumour-like lesions are therefore considered to be formed by inflammation or vasculitis occurring in either the submucosa or muscularis propria, and the involvement may therefore explain the characteristic features observed for this tumour-like lesion in HSP.

In summary, a rare case of HSP with atypical tumour-like lesions in the cecum was herein described. The lesion caused hemorrhaging and then disappeared after the administration of Factor XIII. It is important to immediately administer the appropriate treatment for HSP to resolve such tumour-like lesions as well as other symptoms associated with HSP.

LEARNING POINTS/TAKE HOME MESSAGES ***3 to 5 bullet points***

- The current study presents a rare case of HSP with an intestinal tumour-like lesion in the cecum. Only three such cases, including our present case, have been reported.
- Such tumour-like lesions cause severe haemorrhage and stricture, which lead to deterioration of abdominal symptoms.
- The tumour-like lesion appeared to be formed by the inflammation and haemorrhagic necrosis in either the submucosal layer or a deeper layer, because no obvious vasculitis or other severe changes were observed in the mucosal layer.
- Diagnostic treatment with the administration of steroids and Factor XIII might be useful to confirm the diagnosis of HSP.
- The treatment with Factor XIII is a feasible strategy to cure such tumour-like lesions in HSP patients when the patient presents with a low serum level of Factor XIII. It is important to immediately begin treatment to improve these tumour-like lesions.

REFERENCES ***Vancouver style (Was the patient involved in a clinical trial? Please***

reference related articles)

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Figure captions

Figure 1 A pruritic rash of both the knee and feet

A pruritic rash appeared at the thighs, knee **(A)** and feet **(B)**.

Figure 2 Endoscopic findings in the small and large intestine

Endoscopic examination revealed multiple erosions and irregular-shaped ulceration in the bulbus **(A)** and third portion **(B)** of the duodenum, and a tumour-like lesion in the cecum **(C)**. The multiple ulcerations in the bulbus **(D)** and third portion **(E)** of the duodenum as well as the tumour-like lesion in the cecum **(F)** were completely resolved after the administration of Factor XIII, thus suggesting the efficacy of Factor XIII treatment for the intestinal lesions of HSP.

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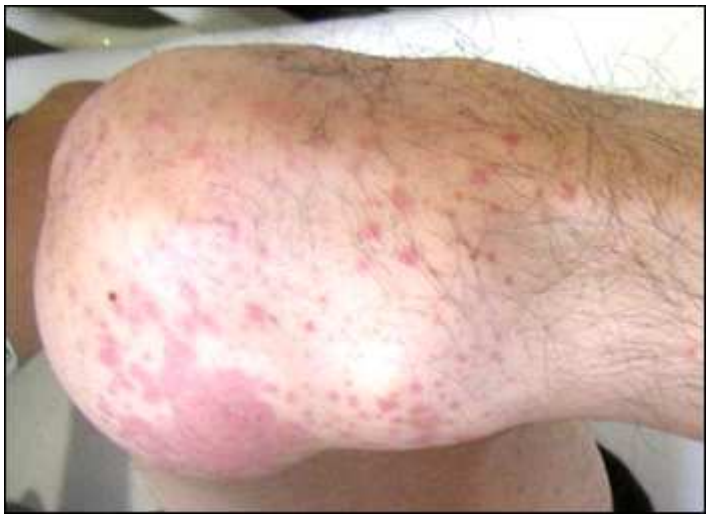

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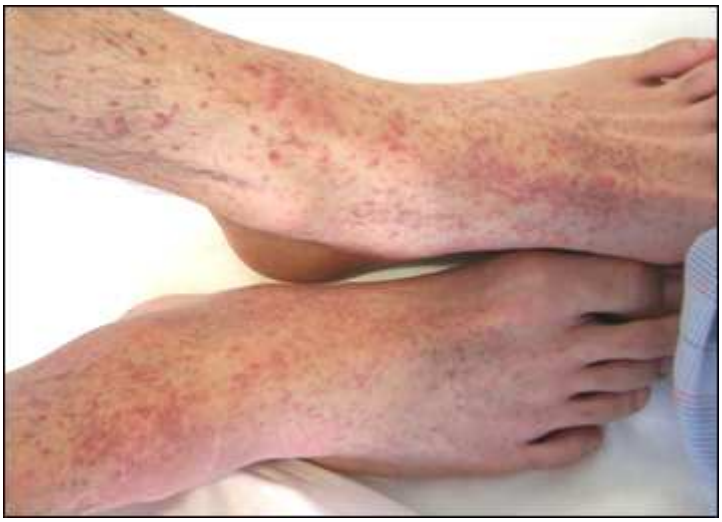

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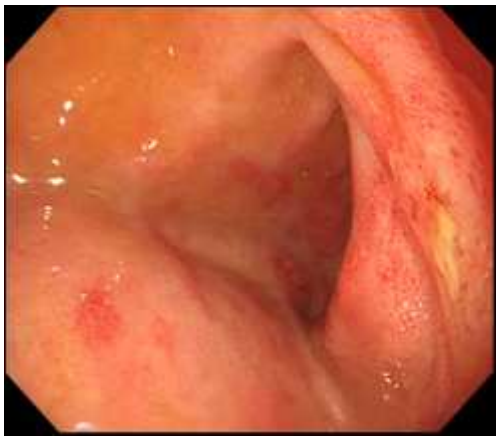

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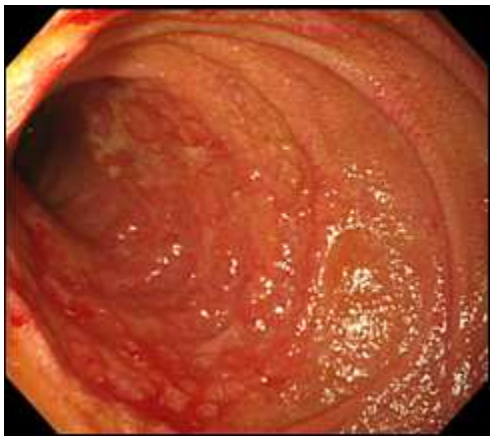

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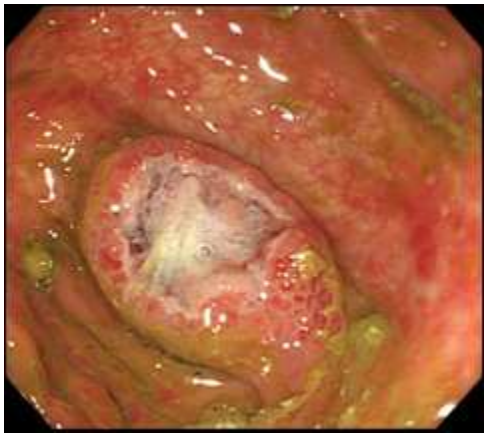

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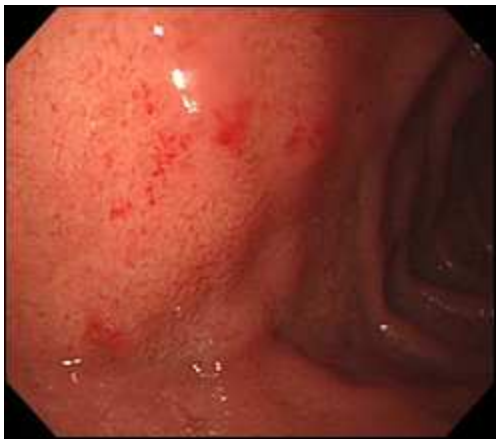

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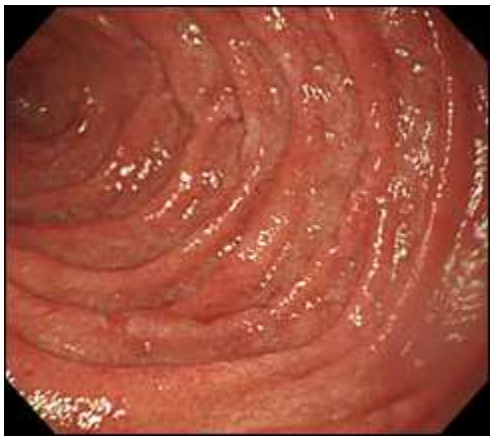

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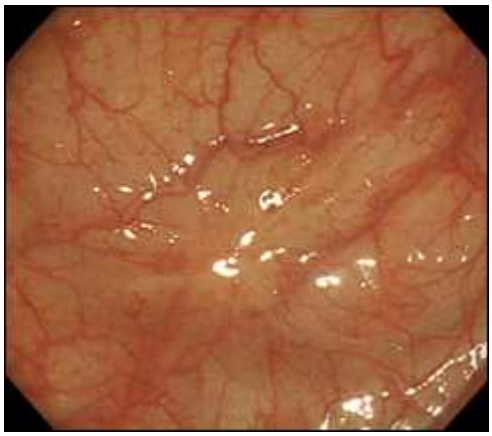

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Table 1 Blood examination

Peripheral blood				Biochemistry			
White Blood Cell	16040	(3500 - 8500)	/μl	Total protein	6.3	(6.0 - 8.0)	g/dl
neutrophil	70.1	(40.0 - 70.0)	%	Albumin	3.2	(3.8 - 5.3)	g/dl
lymphocyte	18.1	(20.0 - 50.0)	%	Total bilirubin	0.7	(0.2 - 1.0)	mg/dl
monocyte	9.1	(2.0 - 9.0)	%	AST	19	(6 - 40)	IU/l
basophil	0.3	(0 - 2.0)	%	ALT	25	(6 - 37)	IU/l
eosinocyte	1	(1.0 - 6.0)	%	LDH	186	(105 - 210)	IU/l
Red Blood Cell	467	(430 - 570)	$x10^4/\mu l$	ALP	195	(96 - 284)	IU/l
Hemoglobin	14	(13.5 - 17.0)	g/dl	γ-GTP	36	(4 - 67)	IU/l
Hematocrit	40.6	(40.0 - 50.0)	%	CK	46	(24 - 195)	IU/l
Platelet	52.9	(150 - 350)	$x10^4/\mu l$	BUN	7	(6 - 20)	mg/dl
				Creatinine	0.52	(0.4 - 1.3)	mg/dl
Coagulation				Sodium	136	(135 - 150)	mEq/l
Prothorombin Time %	78	(70 - 140)	%	Potassium	3.9	(3.5 - 5.0)	mEq/l
activated partial thorombin time	34.9	(24.0 - 40.0)	%	Chlorine	97	(96 - 110)	mEq/l
Fibrinogen	478	(160 - 350)	mg/dl				
D-dimer	17.87	(0 - 0.5)	μg/ml	Serology			
Fibrin Degradation Product	32.1	(0 - 9.9)	μg/ml	C-reactive protein	6.36	(0 - 0.30)	mg/dl
Factor XIII	41	(70 - 130)	%	Antinuclear antibody	negative		

(): normal range

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