

## Colonic High-grade Tubular Adenomas Associated with *Schistosoma japonicum*

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We reported a case of sigmoid colonic high grade tubular adenomas associated with deposited ova of *Schistosoma japonicum*. A 76-year-old Japanese man was referred to our colonoscopy due to a positive fecal occult blood test. He had a medical history of schistosomiasis japonica. The colonoscopy revealed that there were two sigmoid colon polyps, approximately 8 mm in diameter. These were removed by endoscopic mucosal resection (EMR). Pathological examination revealed high grade tubular adenomas and deposited some ova of *Schistosoma japonicum* with severe fibrotic change and granuloma formation in the submucosal layer. Colonic schistosomiasis is a probable independent risk factor for the development of colorectal carcinogenesis.

**Key words:** *Schistosoma japonicum*, colon, adenoma

### INTRODUCTION

Schistosomiasis is a trematode infection affecting more than 200 million people worldwide [1]. Among five schistosome species, *Schistosoma japonicum* (*S. japonicum*) is the most pathologically aggressive, mainly because of its high egg output [1]. There were several endemic foci of schistosomiasis japonica in Japan. Among them, Kofu Basin, Yamanashi Prefecture, was the most severe focus [2]. Since an anti-schistosoma control program of 1977 was successful in eradicating *S. japonicum* in Japan, no new cases have been reported in Japan [3]. Here, we report a case of colonic high-grade tubular adenomas associated with chronic schistosomiasis and discuss its possible role in carcinogenesis.

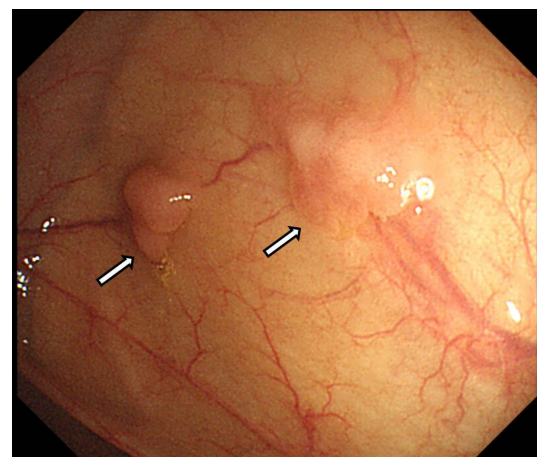
### CASE REPORT

A 76-year-old Japanese man was referred for colonoscopy owing to a positive fecal occult blood test result. He had no personal and family history of intestinal cancer. He had a medical history of schistosomiasis japonica, when previously he was in Yamanashi Prefecture. He has never been to tropics and subtropics. His physical examination and basic laboratory test results were normal. Abdominal ultrasonography showed no calcification in the liver. The colonoscopy revealed two sigmoid colon polyps, approximately 8 mm in diameter (Fig. 1), which were removed via endoscopic mucosal resection (EMR). The next day after the EMR, he was discharged from the hospital without any complications. Pathological examination revealed high-grade tubular adenomas and deposited 50–80  $\mu\text{m}$  ova of *S. japonicum*, with severe fibrotic and calcified change in the submucosal layer (Fig. 2a, b,

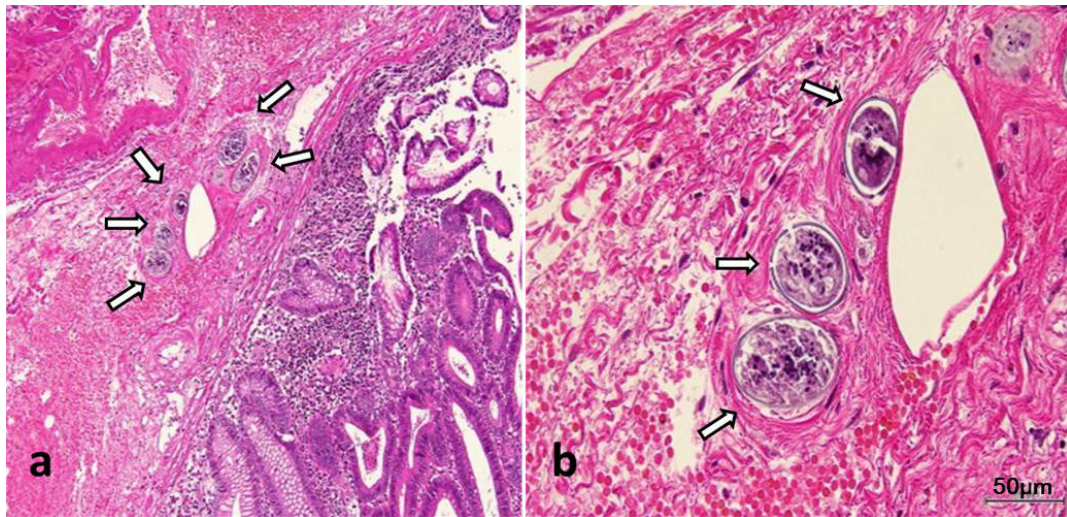
hematoxylin-eosin [H & E] staining, original magnifications  $\times 100$  and  $\times 400$ ).

### DISCUSSION

Schistosomiasis is a trematode parasitic infection in which terminal hosts are humans or other mammals and intermediate hosts are freshwater snails [2]. *S. japonicum* is isolated mainly from Southeast Asia and Western Pacific countries. The major pathogenic processes in *S. japonicum* are caused by eggs, not by adult worms. Eggs in the intestine cause damage to the mucous membrane and initiate an inflammatory reaction that results in colitis with ulceration, microabscess formation, pseudopolyposis, and carcinogenesis [3]. The underlying mechanism of schistosome in-



**Fig. 1** The colonoscopy image showing the two sigmoid colon polyps approximately 8 mm in diameter. (White arrow heads indicate colon polyps)



**Fig. 2** Pathological examination result showing the high-grade tubular adenomas and deposited ova of *Schistosoma japonicum*, with severe fibrotic change and granuloma formation in the submucosal layer. Hematoxylin-eosin stain, original magnifications: (a)  $\times 100$  and (b)  $\times 400$ . (White arrow heads indicate *S. japonicum* ova)

fection-induced carcinogenesis remains unclear, but several reports have shown its relevancy [4–6]. We paid attention to the severe inflammation and fibrosis in the submucosal layer in the present case. In basic study, experimental *Schistosoma* infections in mice led to a dynamic Th2 cytokine-mediated pathological process [7–9]. Moreover, *S. japonicum* ova can prevent the TNBS-induced colitis in mice and the mechanisms are due to the regulation of Th1/2 balance and TLR4 expression [9]. Th2 dominant or M2 macrophages can participate in the pathogenic process of different types of solid tumors by promoting angiogenesis and metastasis, and inhibiting antitumor activity [10, 11]. We could consider these immunological imbalances as a possible mechanism of schistosome infection-induced carcinogenesis.

This case did not identify any calcification in other organs which is a possibility of secondary targets, such as kidneys and liver [12, 13]. However, previous reports showed that some organs affected by ectopic granulomata include the central nervous system, genital organs, skin and eyes [13–16]. Therefore, we might check more detail systemic examinations.

In conclusion, a history of colonic schistosomiasis is a probable independent risk factor of the development of colorectal carcinogenesis. Therefore, screening for colorectal cancer should always be performed thoroughly with routine endoscopy in patients with history of previous schistosomiasis and the underlying mechanism of schistosome infection-induced carcinogenesis should be further investigated.

The authors declare that they have no conflicts of interest.

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