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# A case of abdominal compartment syndrome derived from simple elongated sigmoid colon in an elderly man

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## ABSTRACT

**INTRODUCTION:** Abdominal compartment syndrome or intra-abdominal hypertension may occur after intra-abdominal events, but their etiology and clinical signs remain unclear. We report a case of abdominal compartment syndrome in an elderly patient without other risk factors.

**PRESENTATION OF CASE:** An 86-year-old man had been admitted to our hospital several times for a dilated sigmoid colon with elongation, and had complained about abdominal pain and abdominal fullness. At every admission we decompressed the sigmoid colon gas by colonoscopy, resulting in early discharge the following day. Recently, the patient developed dementia and experienced reduced activities of daily living that are common with aging. He frequently complained of severe abdominal distension with hypotension, tachycardia and tachypnea, and finally entered hospital twice a week. We decided to perform elective surgery, which showed abdominal compartment syndrome caused by elongated sigmoid colon without volvulus (the first reported case).

**DISCUSSION AND CONCLUSION:** Considering the increase in the aging population, we must bear in mind that abdominal compartment syndrome may occur in simple elongated sigmoid colon without other risk factors.

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## 1. Introduction

Abdominal compartment syndrome (ACS) is defined as a sustained intra-abdominal pressure (IAP) associated with new organ dysfunction/failure [1]. ACS or intra-abdominal hypertension (IAH) may occur after intra-abdominal events such as surgery, trauma and peritonitis. ACS progression can be life threatening with multiple organ dysfunction in the respiratory, cardiac, renal and gastrointestinal systems. Emergency laparotomy for abdominal decompression is often considered in patients with ACS [1–7]. However, the risk factors and clinical signs of IAH and ACS remain unclear [8]. We report the first known case of ACS owing to simple elongated sigmoid colon, without volvulus or peritonitis.

### 1.1. Presentation of case

An 86-year-old man presented at our hospital for chronic constipation with elongated sigmoid colon. He didn't take any medicine

**Abbreviations:** ACS, abdominal compartment syndrome; IAH, intra-abdominal hypertension; IAP, intra-abdominal pressure.

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that could slow up the bowel movements, as anti-depressive drugs or another. He complained of abdominal distension and was treated with a laxative. However, he was admitted to hospital because of progressed abdominal distension. Moreover, the frequency of his admission to hospital had increased up to once a month. At each admission, he was treated with colonoscopy to remove sigmoid colon gas, subsequently becoming symptom-free. The patient has developed several symptoms of dementia along with his aging, which have led to poor performance status. Recently, on admission, he suffered from severe abdominal distension with hypotension, tachycardia and tachypnea twice a week. IAP was measured using the *trans*-bladder method and showed elevated IAP of 21 mmHg. ACS was diagnosed. Abdominal X-ray showed a large quantity of sigmoid colon gas and elevated bilateral diaphragm (Fig. 1). We made an initial decision for emergency surgery. However, laboratory investigations were unremarkable for blood cell count, biochemical factors and blood gas. Contrast-enhanced computerized tomography (CT) scan demonstrated that the sigmoid colon was only elongated at the extremities and dilated with the large quantity of gas, and apparent volvulus was not observed. Meanwhile, the patient's inferior vena cava had collapsed because of the dilated colon (Fig. 2). At this time, we decided to decompress colon gas by colonoscopy, instead of performing emergency laparotomy. After abdominal decompression, he recovered immediately as on the previous occasions. However, we decided to perform



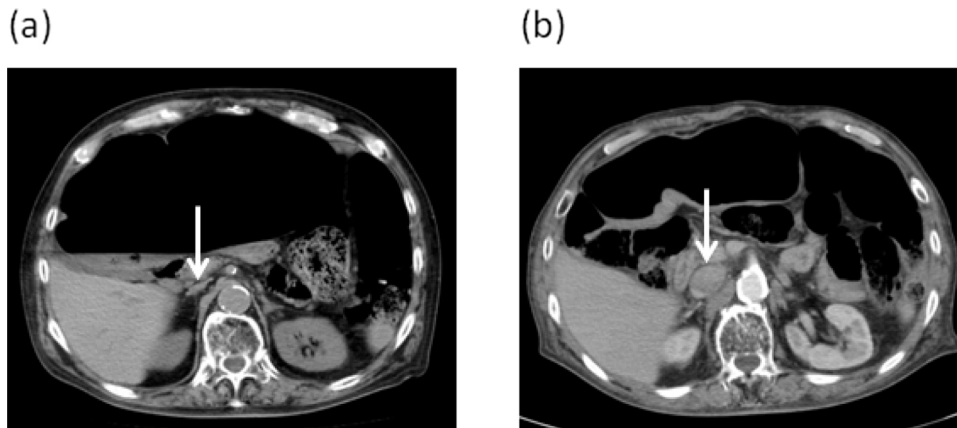
**Fig. 1.** Abdominal X-ray revealed a dilated sigmoid colon with bilateral diaphragmatic elevation.

elective surgery the day after the interventional decompression by colonoscopy. On laparotomy, his sigmoid colon was approximately 100 cm in length, but his rectum was normal. The descending colon was completely fixed to the retroperitoneum. The dilated sigmoid colon was successfully resected, and the subsequent reconstruction was done by functional end-to-end anastomosis (Fig. 3). Histological examination showed normal sigmoid ganglion cells, and the patient was diagnosed with simple elongated sigmoid colon without volvulus and idiopathic megacolon. His postoperative course was uneventful.

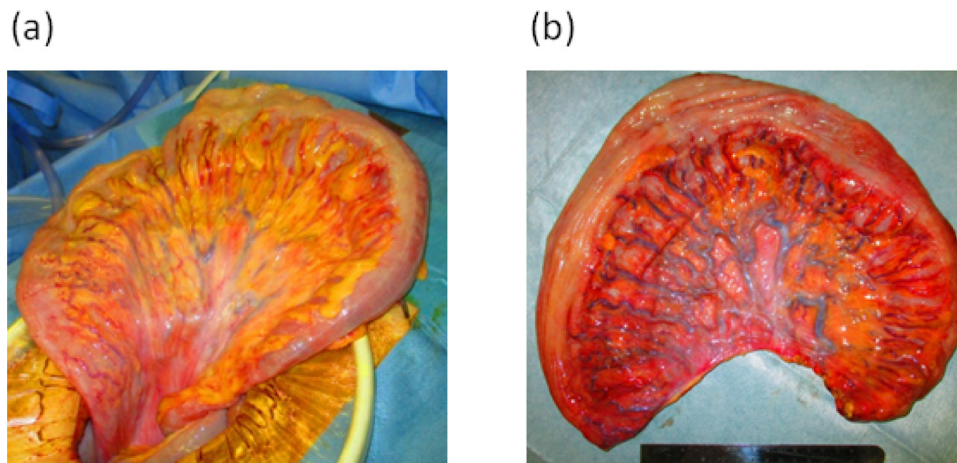
**2. Discussion**

Increased IAP has been known since the late 19th century. ACS was first reported by Kron et al. in 1984, who described its pathophysiology resulting from IAH secondary to aortic aneurysm surgery [9]. ACS is defined as a sustained IAP > 20 mmHg that is associated with new organ dysfunction/failure [1].

Elevated IAP possibly induces adverse effects on pulmonary, cardiovascular, renal, splanchnic, musculoskeletal and central nervous system physiology [1–7]. For example, IAP causes a direct reduction in cardiac output resulting from the decreased cardiac venous return from the inferior vena cava and portal vein. The elevated diaphragm causes reductions in total lung capacity, functional residual capacity and residual volume. The disordered physiology following IAH may result in a clinical syndrome with significant



**Fig. 2.** Abdominal CT scan of the patient pre-decompression (a) and post-decompression (b). The arrow shows the inferior vena cava, which was collapsed pre-decompression.



**Fig. 3.** Lower abdominal midline laparotomy revealed sigmoid colon was extremely elongated and dilated. Elongated and dilated sigmoid colon (a) and resected sigmoid colon (b).

morbidity and mortality. The correct diagnosis of ACS onset and timely appropriate intervention are required for optimal outcome.

Although the exact incidence of ACS has not been established [8], studies have increasingly examined ACS in certain groups. Abdominal surgery, major trauma, volvulus, acute pancreatitis, liver dysfunction, sepsis, shock, obesity and age have all been reported as risk factors for ACS [1,10].

In the present case, we diagnosed ACS originating from a simple elongated sigmoid colon, because we observed abdominal distension with elevated IAP, hypotension, tachycardia and tachypnea. CT scan and colonoscopy revealed simple elongated sigmoid colon without volvulus. Age was the only suspected risk factor for ACS in our case. The mental and physical functions of this patient were gradually declining owing to his progressive dementia [11]. IAH or ACS may become more common with a growing aging population, particularly in Japan.

Several previous reports have demonstrated IAH and ACS triggered by sigmoid volvulus or peritonitis [12]. However, ours is the first case of ACS based on simple elongated sigmoid colon. This report may serve as a warning case for surgeons that ACS may occur even in simple elongated colon without volvulus or peritonitis.

### 3. Conclusion

We described for the first time a case of ACS originating from an elongated sigmoid colon in an elderly man. Considering the growing aging population and higher likelihood of ACS, surgeons will need to precisely diagnose ACS and determine the optimal time for surgery.

### Conflicts of interest

We have no financial conflicts of interest to disclose concerning this case report.

### Funding

We don't have any sources of funding.

### Ethical approval

The present case report was approved by our hospital's institutional review board. The patient provided informed consent for this report.

### Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy

of the written consent is available for review by the Editor-in-Chief of this journal on request.

### Author contribution

MS has made substantial contributions to the conception and design of the case report. YK has been involved in drafting of the manuscript and revised it critically for important intellectual content. MT and HT contributed to surgery in this case. All authors read and approved the final manuscript.

### Guarantor

Masaaki Shida accepts the full responsibility for the article.

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