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Diagnosis and Treatment of Small Bowel Strangulation Due To Congenital Band: Three Cases of Congenital Band in Adults Lacking a History of Trauma or Surgery

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Data Interpretation D
Manuscript Preparation E
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Case series

Patients: Male, 33 • Male, 18 • Male, 19
Final Diagnosis: Congenital band causing a small bowel obstruction
Symptoms: Progressive abdominal pain that eventually becomes excessive
Medication: —
Clinical Procedure: Laparoscopic band removal
Specialty: Surgery

Objective: Rare disease
Background: Among the causes of constipation are bands and adhesions that lead to obstructions at different points in the intestinal tract. These can occur as a consequence of healing following surgery or trauma. However, an entity known as congenital band exists where a band is present from birth. Here we report three such cases of adults with symptoms of intestinal obstruction, in whom a congenital band was discovered through exploratory laparoscopy.
Case Reports: All three of these patients presented lacking a history of any abdominal trauma or previous abdominal surgeries, a fact that is often used to exclude an adhesion as a differential. All three recovered quickly and had relief of their symptoms following surgical intervention.
Conclusions: Bands and adhesions are common surgical causes of small bowel obstruction, leading to symptoms such as nausea, vomiting, constipation, and obstipation. These bands almost always result from a prior abdominal surgery or from a recent abdominal trauma. The three cases presented here show a far more unusual picture of a band, one that is congenitally present, as there was an absence of such a history. This is significant because clinical suspicion of a band is often very low due to a lack of distinguishing clinical and diagnostic features, and when the past history is negative.

MeSH Keywords: General Surgery • Hand-Assisted Laparoscopy • Laparotomy

Full-text PDF: <http://www.amjcaserep.com/abstract/index/idArt/899664>

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Background

Constipation is one of the most common complaints faced by physicians and emergency departments. It accounts for nearly 5% of hospital visits and consists of a very broad set of differential diagnoses, including but not limited to bowel obstruction, neurogenic conditions, and congenital bands [1]. Although congenital bands that lead to intestinal obstruction are extremely rare, if not identified early enough, they can lead to dangerous and often life-threatening situations. Congenital bands arise from abnormal adhesions of peritoneal folds that form during the process of embryogenesis [2]. These bands can be found anywhere along the GI tract (e.g., ascending colon, ileum, ligament of Treitz, etc.). For this reason, surgical exploration in the context of a vague presentation of bowel obstruction should always be considered [2]. Furthermore, it is important to keep in mind that small bowel obstruction due to a band cannot be ruled out, even in the absence of history of abdominal trauma or prior surgical procedure. In this case report, three different presentations of congenital bands are discussed.

Case Report

Case 1 (Videos 1–3)

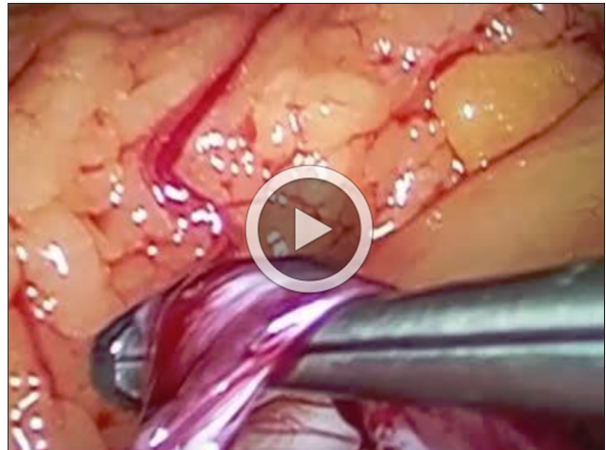
A 33-year-old male, previously healthy, presented for diffuse abdominal pain. His pain was mainly epigastric, non-radiating, and not relieved by changes in his position or by analgesics. He denied vomiting, diarrhea, fever, and chills. Additionally, he denied any history of abdominal trauma as well as any prior abdominal surgeries.

His past medical history as well as family history were unremarkable. He had no known drug or food allergies, denied smoking, and occasionally drank alcohol. Prior to admission, this patient had been admitted twice to other hospitals. During both of these admissions he was diagnosed with small bowel obstruction for which he was treated by nasogastric tube decompression and kept non per os. He was then discharged home after his pain was relieved and flatus was passed.

Upon physical exam, the patient appeared pale, with a distended, soft abdomen, and positive bowel sounds. Upper abdominal tenderness was noted on palpation.

Vitals signs were as follows: heart rate (HR) 85, O₂ saturation 99%, respiratory rate (RR) 22, temperature 37°C. Labs were not significant (Table 1).

A computed tomography (CT) scan was ordered the same day, showing the presence of a significant gastric and duodenal distension proximal to a magma containing small bowel



Video 1. Laparoscopic removal of the congenital band for case one: part one.



Video 2. Laparoscopic removal of the congenital band for case one: part two.



Video 3. Laparoscopic removal of the congenital band for case one: part three.

(Figures 1–3). No significant retroperitoneal or mesenteric lymph nodes were noted. The picture is compatible with a

Table 1. Lab results for case 1 on admission.

Reading	Value
WBC	8.07
Neutrophils	47%
HGB	15.4
HCT	42.6
BUN	9
Creatinine	0.85
Platelets	203
Total bilirubin	0.72
Direct bilirubin	0.12

Reading	Value
Sodium	139
Potassium	3.5
Amylase	88
Lipase	41
SGPT	17
SGOT	23
GGT	9
Alkaline phosphatase	38
CRP	Normal

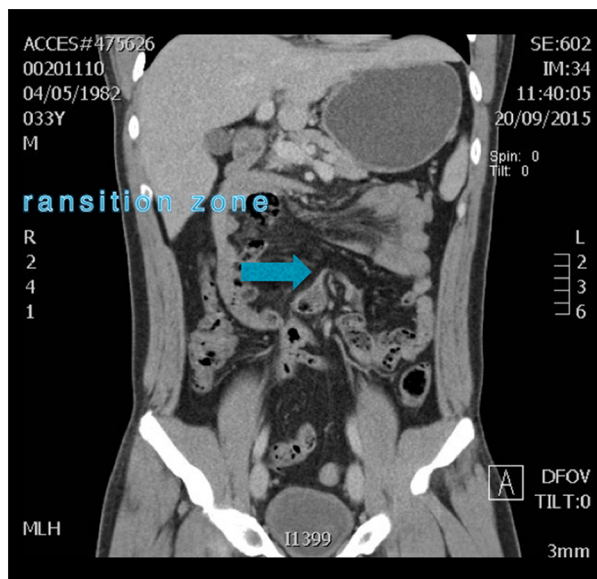


Figure 1. Coronal cut abdominal pelvic CT of case 1 showing a transition zone in the small bowel.

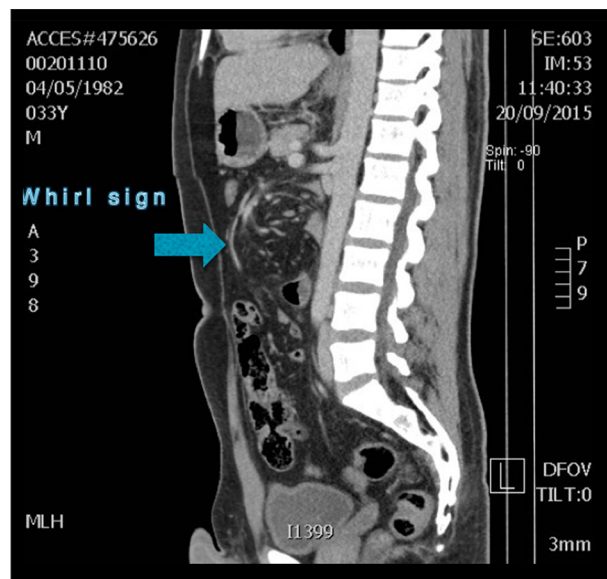


Figure 2. Sagittal cut abdominal pelvic CT of case 1 showing whirl sign in the small bowel.

volvulus, internal hernia, or the presence of a band at this level. Additionally, fluid was noted in the Douglas pouch.

Following these laboratory and imaging results, the patient was kept non per os and given intravenous hydration. A nasogastric tube was inserted, from which one liter of a yellowish secretion was excreted.

The following day, the patient experienced intractable abdominal pain that led to the decision to perform an exploratory laparoscopy, despite no changes being noted in the labs and vitals.

The patient was then transferred to the operating room (OR) for laparoscopy, where 3 trocars were inserted. During the

exploration, two bands, one at the level of the upper jejunum and one at the angle of Treitz, were noted. There was no ischemia or peritonitis. The two bands were excised, and an upper GI series was performed two days postoperatively, which was normal and showed no signs of obstruction. The patient was discharged home on a soft diet following stabilization of his condition and relief of symptoms.

Case 2 (Video 4)

Case 2 was an 18-year-old male patient recently diagnosed with acute myeloblastic leukemia, status post induction chemotherapy one month ago, which was complicated by febrile neutropenia. He had been scheduled to undergo allogenic stem

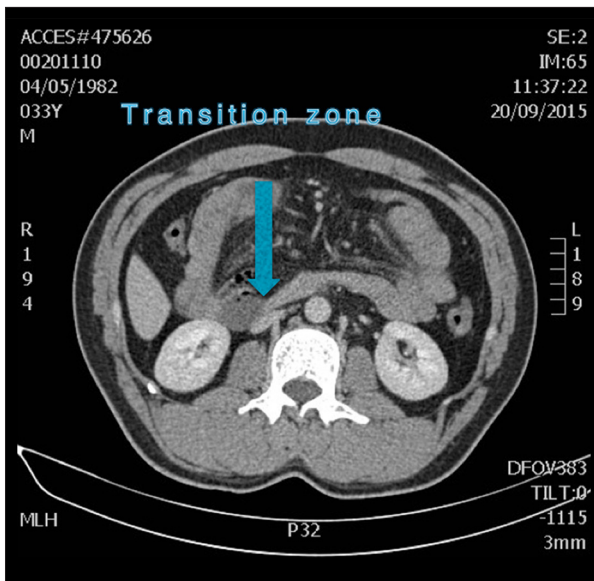


Figure 3. Transverse cut abdominal pelvic CT of case 1 showing a transition zone in the small bowel.



Video 4. Laparoscopic removal of the congenital band for case two.

cell transplantation. This patient presented for consolidation therapy prior to transplant.

One day prior to admission the patient complained of diffuse, crampy abdominal pain, radiating to the back in a belt-like manner. The pain was mildly relieved by analgesics and by leaning forward. His pain was felt mainly postprandially, and he denied vomiting or constipation although postprandial nausea was noted. Additionally, the patient denied fever and chills.

Past medical history was unremarkable with the exception of the diagnosis of acute myeloblastic leukemia. The patient had no history of abdominal trauma or prior abdominal surgeries.

No known drug or food allergies were noted. The patient's current medications included Valtrex (valacyclovir), Bactrim

Table 2. Lab results for case 2 on admission.

Reading	Value
WBC	7.4
Neutrophils	67.2%
HGB	14.3
Platelets	185
Sodium	139
Potassium	4
SGOT	23
SGPT	60
GGT	30
Alkaline phosphatase	73
Total bilirubin	0.79
Direct bilirubin	0.09
Calcium	10
Magnesium	1.8
Amylase	Normal
Lipase	Normal

(sulfamethoxazole and trimethoprim), Oспен (phenoxymethylpenicillin), and Normix (rifaximin), which were being taken as prophylaxis due to his immunocompromised state.

Physical exam shows positive bowel sounds, soft abdomen, tenderness on palpation, and guarding.

Vital signs were as follows: HR 88, temperature 37.3°C, RR 18, and O₂ saturation 98% Labs upon admission were not significant (Table 2).

A CT scan of the abdomen and pelvis with intravenous contrast showed the presence of mesenteric fat infiltration in the left upper quadrant, associated with multiple nodes and a “whirlpool “ sign, as well as some jejunal dilation distally (Figures 4, 5). This was compatible with an internal hernia, to be correlated with clinical findings. Presence of liquid in the Douglas pouch was also noted.

The patient was then transferred to the OR for exploratory laparoscopy, which involved insertion of three trocars. A band was identified occluding the jejunum. Erythema and congested loops were noted. The band was excised and sent to pathology, which reported a fibrous, inflammatory tissue. Peritoneal fluid analysis revealed a reactive inflammatory fluid.

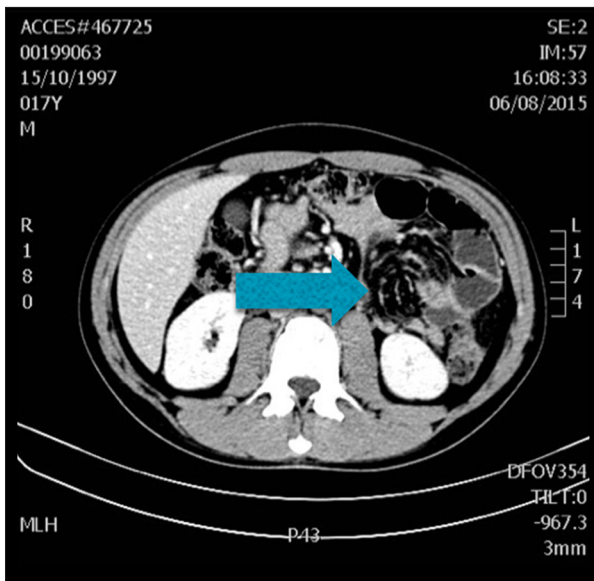


Figure 4. Transverse cut abdominal pelvic CT of case 2 showing a whirl sign in the small bowel.

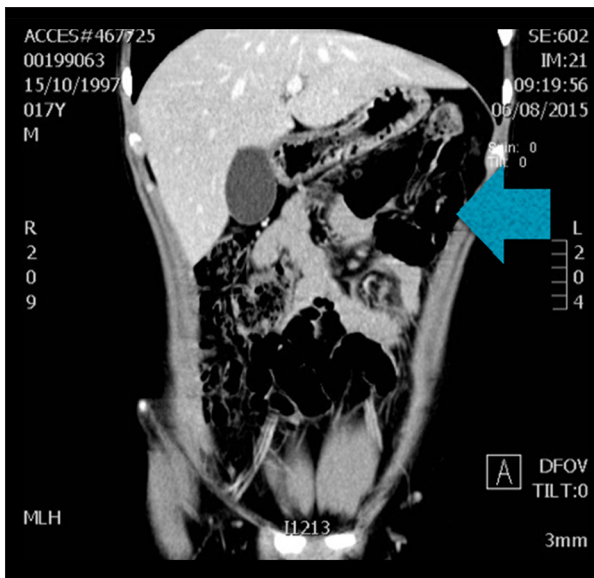


Figure 5. Coronal cut abdominal pelvic CT of case 2 showing small bowel obstruction.

Case 3

A 19-year-old male patient presented for a one-week history of diffuse abdominal pain, mainly at the upper quadrants. The pain was associated with nausea, vomiting, and obstipation of two days' duration. Furthermore the pain radiated to the back, was mainly postprandial, and was slightly relieved by pain killers.

Table 3. Lab results for case 3 on admission.

Reading	Value
WBC	11.31
HGB	15.4
HCT	42.7
Platelets	194
Amylase	Normal
Lipase	Normal
CRP	<5
BUN	21
Creatinine	1.01
Sodium	138
Potassium	3.9
Chloride	106
CO ₂	22

Past medical history was unremarkable. Occasional tobacco and alcohol consumption was noted. The patient denied a previous history of direct abdominal trauma or abdominal surgeries.

Physical exam revealed a soft distended abdomen with hyperactive bowel sounds. The abdomen was tympanic to percussion with diffuse tenderness to palpation.

Vital signs upon admission were as follows: blood pressure (BP) 110/70, pulse (P) 64, and temperature (T) 36°C. Labs upon admission were unremarkable (Table 3).

A CT scan of the abdomen and pelvis with intravenous contrast was done and showed small bowel dilatation of the middle third and distal third of the jejunum. There was also, to a lesser degree, an ileal dilatation that did not extend to the terminal ileum (Figures 6, 7). Additionally, a moderate effusion was noted in the cul-de-sac.

The patient was kept non per os and was started on antibiotics. A nasogastric tube was inserted, and fluid input and output were monitored accurately.

During the following day, the patient remained obstipated with diffuse abdominal pain noted upon palpation. The nasogastric tube gave 500 cc of fluid. The decision was made to proceed with an exploratory laparotomy.

The procedure was begun with a midline infraumbilical laparotomy incision. Dilated small bowel loops were identified from

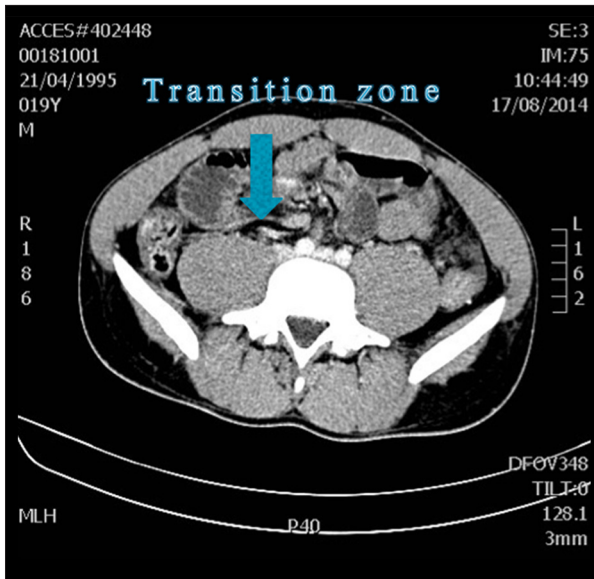


Figure 6. Transverse cut abdominal pelvic CT of case 3 showing transition zone in the small bowel.

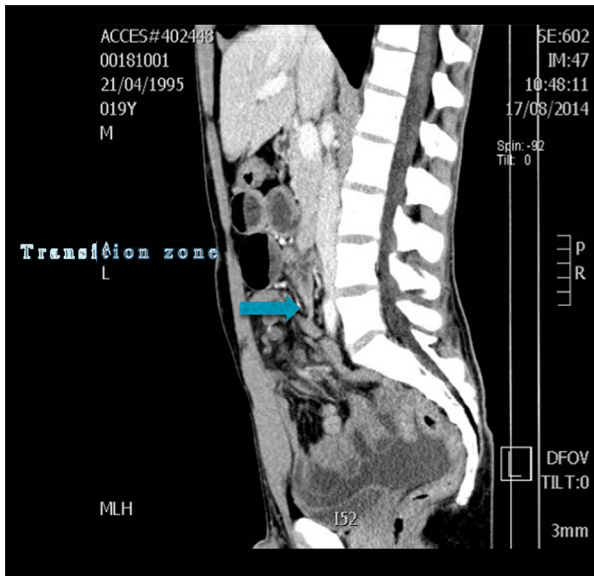


Figure 7. Sagittal cut abdominal pelvic CT of case 3 showing a transition zone in the small bowel.

the mid jejunum until the terminal ileum. Two mesenteric bands were identified. One band was identified in the mid jejunum and the other in the terminal ileum (Figures 8, 9). Enterolysis was performed to liberate the bowel loops. Afterwards the bowels were cleared via retrograde emptying by milking and gastric aspiration. The abdomen was then washed well and closed.

The patient improved significantly. Flatus was passed at day two post-laparotomy, following which the nasogastric tube was removed and per os diet was initiated. The patient was discharged home on a soft diet and with stable vitals.

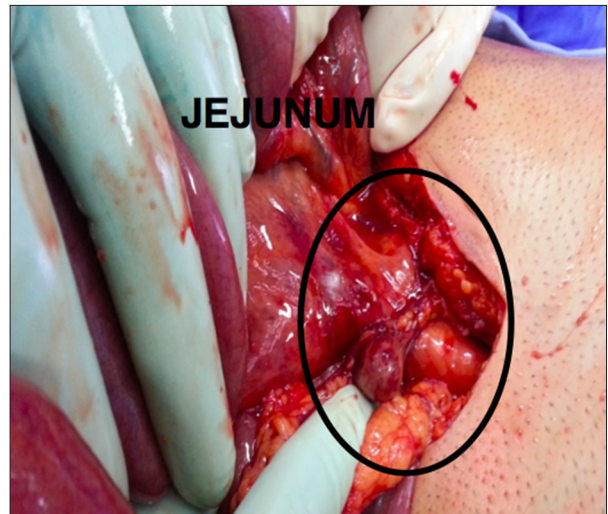


Figure 8. Case 3 band causing obstruction of the small bowel at the level of the jejunum.

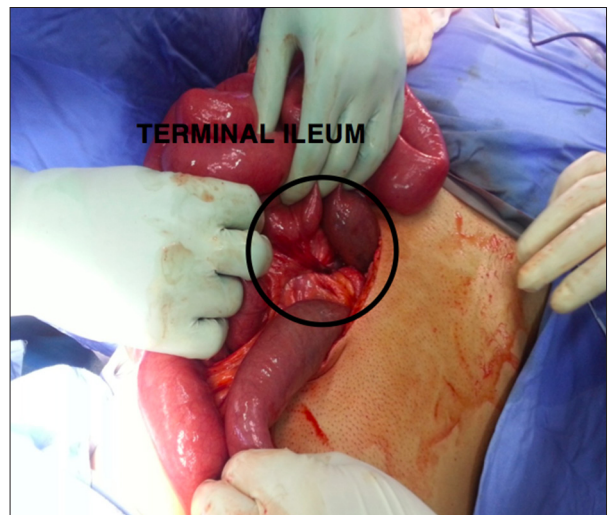


Figure 9. Case 3 band causing small bowel obstruction at the level of the terminal ileum.

The pathology revealed a fibro-inflammatory band with no signs of malignancy.

Discussion

Adhesive bands in patients lacking a history of direct abdominal trauma or inflammatory condition are a very rare occurrence. Furthermore, small bowel obstruction due to such congenital bands is exceedingly infrequent, with an exact incidence that remains unclear [1]. These congenital bands are an infrequent cause of obstruction in childhood and are extremely rare in adults [2,3]. Our three reported cases ranged from the ages of 19 to 33 years old, well outside the typical age range of presentation. Because of this, as well as the rarity of this

pathology, physicians often maintain a very low index of suspicion of obstruction due to a band in adult patients.

Occlusion due to these bands results either from compression of the small bowel or from trapping of the intestines between the band and the mesentery. However, symptoms are usually those found in any kind of intestinal obstruction, a fact that makes preoperative diagnosis difficult. Similarly, findings on KUB are nonspecific. Ultrasound and CT scan may give details such as localized distended loops or signs of peritonitis, while a barium-contrast gastrointestinal series may provide additional clues to the diagnosis [4]. In our cases, imaging yielded findings such as the “whirlpool” sign, which is often seen in patients with a volvulus or internal hernia. This further illustrates the need to maintain congenital band as a differential in small bowel obstruction, even when the imaging can point to a different diagnosis.

Despite looking different from postoperative adhesions intraoperatively, there is no difference in the clinical picture and initial workup. The difference lies in the absence of a history of abdominal surgery or trauma, something that is often used to rule out a band as the cause of obstruction, leading to a missed diagnosis or delayed intervention. Thus, it is important to maintain a high index of suspicion in patients of any age presenting with signs and symptoms of small bowel obstruction and to keep obstruction due to a band as a differential diagnosis, because the only way to distinguish the diagnosis is through surgical exploration.

Different sites of obstruction have been reported in the literature. Akgur et al. reported eight cases of bands located most commonly between the right colon and ileum as well as between the Treitz angle and the terminal ileum, between the right lobe of the liver and the terminal ileum, and between the right lobe of the liver and the right colon [3]. Lin et al. reported a case of a band migrating from the iliac fossa to the sigmoid colon [5], while Itagaki et al. reported a jejuno-jejuno band [6]. The band was well vascularized in all of these cases [4]. In reference to the cases presented in this report, we note several locations of the identified congenital bands. In case 1, two bands were identified, one at the high jejunum and the other at the Treitz angle. In case 2, one band was identified at the level of the jejunum, while in case 3, two mesenteric bands were identified at the level of the jejunum and terminal ileum.

Two of the patients were previously healthy with no reported home medications. In case 2, the patient had a known history of acute myeloblastic leukemia and was taking the four medications listed above in the case (Valtrex, Bactrim, Normix, Oспен). However, there is nothing reported in the literature that correlates acute myeloblastic leukemia or the above medications with formation of bands in the abdomen or any other type of adhesion.

Out of 32 cases of congenital bands reported in the literature [6–11], 2 deaths were reported, correlating with a 94% survival rate [2,3]. Overall prognosis is very good, although a good index of suspicion needs to be maintained to ensure that the diagnosis of congenital band is not dismissed.

More recently the method of laparoscopic exploration has gradually become accepted as a feasible and low-risk option for the diagnosis of the cause of small bowel obstruction [12–24]. This method provides the added benefit of allowing for simultaneous intervention and relief of the obstruction. Additionally, this step is required for the final diagnosis and treatment of a congenital band. Thus, in addition to a high index of suspicion, a low threshold for the use of surgical exploration should be maintained. The success rate for adhesiolysis using laparoscopy in small bowel obstruction ranges from 48% to 82%. Conversion to laparotomy is usually due to the presence of bowel gangrene, massive adhesion, failure to identify the etiology or location of the occlusion, and bowel perforation during the procedure [15–20]. Exclusion criteria for the laparoscopic approach include patients with poor general condition, sepsis, peritonitis, extremely dilated bowel loops, and previous laparotomies [12]. In our cases, two patients were treated with a laparoscopic approach, while the third was treated by laparotomy due to an increased risk of bowel ischemia.

Laparoscopic treatment in small bowel obstruction is advantageous because it is associated with a shorter operative time, fewer postoperative adhesions, a lower rate of wound infection, quicker recovery, a shorter stay in hospital, and less pain. Conversion to laparotomy is not a failure, but rather, an obligatory step in management [25].

Conclusions

Small bowel obstruction due to bands is a very rare occurrence, especially in patients lacking a history of abdominal surgery or trauma. Here we report three such cases of small bowel obstruction caused by congenital bands in three separate adults, which were identified following laparoscopic exploration. Treatment was initiated by laparoscopic excision of the bands, which led to immediate resolution of symptoms. These three patients fall well outside the age norm for presentation of obstruction due to a congenital band, so the differential should be maintained even in adult patients. Diagnosis of this pathology is often difficult because of the lack of history of trauma or prior abdominal surgery, as well as the lack of distinguishing findings on history, physical exam, and imaging. Therefore, in order to make the proper diagnosis, congenital band should always be kept as a differential diagnosis regardless of the age of the patient, and a high index of suspicion should be maintained with a low threshold for exploratory laparoscopy or laparotomy.

Conflicts of interest

No conflicts.

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