

Ileo-Ileal Knotting; - A Case Report of 60-Year-Old Male Patient

Tewodros Tadesse Tessema¹, Murtii Teressa Obolu^{2*} , Abdullahi Mohamed³, Tadesse Getachew Mulisa⁴, Gebril Ahmed⁵, Gediyon Getachew Gebo⁶

¹MD, Consultant General surgeon, Assistant Professor of surgery, Department of Surgery College of Medicine & Health Science, Hawassa University, Hawassa, Sidama, Ethiopia

***Corresponding Author**

Murtii Teressa Obolu. MD, Senior Resident, Chief General Surgery Resident, Department of Surgery College of Medicine & Health Science Hawassa University, Hawassa, Sidama, Ethiopia.

²MD, Senior Resident, Chief General Surgery Resident, Department of Surgery College of Medicine & Health Science Hawassa University, Hawassa, Sidama, Ethiopia

Submitted: 2024, Oct 23; **Accepted:** 2024, Dec 17; **Published:** 2025, Jan 20

³MD, Senior Resident in General Surgery, Department of Surgery College of Medicine & Health Science Hawassa University, Hawassa, Sidama, Ethiopia

⁴MD, Senior Resident in General Surgery, Department of Surgery College of Medicine & Health Science Hawassa University, Hawassa, Sidama, Ethiopia

⁵MD, General practitioner, Department of Surgery College of Medicine & Health Science Hawassa University, Hawassa, Sidama, Ethiopia

⁶MD, Senior Resident in General Surgery, Department of Surgery College of Medicine & Health Science Hawassa University, Hawassa, Sidama, Ethiopia

Citation: Tadesse, T. T., Obolu, M. T., Mohamed, A., Mulisa, T. G., Ahmed, G. at al. (2025). Ileo-Ileal Knotting; - A Case Report of 60-Year-Old Male Patient. *Gen Surgery Clin Med*, 3(1), 01-05.

Abstract

Background: Ileo-Ileal knotting is a rare form of mechanical small bowel obstruction. Which is a classic closed loop obstruction syndrome. Even though the exact etiology is not known, prolonged fasting followed by sudden food overload with frequent peristalsis of Ileum in a muscular abdominal wall are documented predisposing factors for knotting of bowel in literature.

Case Presentation: Our patient was presented with a sudden onset of severe persistent crampy abdominal pain localized to all over abdomen associated with, multiple episodes of bilious vomiting, failure to pass faeces and flatus and low-grade fever of twelve hour. Otherwise, no history of abdominal trauma, no prior pertinent past surgical and medical history. Up on objective assessment he was acute sick looking, tachycardic, hypotensive, tachypnic, febrile, distended, tender abdomen and empty rectum on digital rectal examination.

Result: Patient was investigated with complete blood count and plain abdominal x-ray alongside with preoperative optimization and there was left shift leukocytosis on complete blood count test and centrally located multiple air fluid level with dilated bowel and absence of rectal gas shadow on plain abdominal x-ray. With impression of gangrenous small bowel obstruction secondary to small bowel volvulus patient was explored and intraoperatively gangrenous Ileo-Ileal knotting was diagnosed and enblock resection, Ileo-Ileal end-to-end anastomosis was done and post operatively patient outcome was satisfactory and doing well on follow up.

Conclusion: The goal of surgical management is enblock resection of involved bowel segment proximal to the knot point with restoration of bowel continuity and strict control of systemic toxic substance and bacterial dissemination during resection. Mainly, outcomes depend on level of systemic sepsis dissemination and length of small bowel involved in the gangrenous knot.

Keywords: Ileo-Ileal Knotting, Closed Loop Obstruction Syndrome, Enblock Bowel Resection

1. Introduction

Knotting is a clinical condition when segment of one hollow/solid organ wrapped around the adjacent/surrounding other hollow/solid organ result in complete bowel obstruction. Ileo-Ileal knotting is wrapping of one Ileum segment at around the other part of Ileal segment or its mesentery resulting in closed loop obstruction. However, knotting is rare pathology among all other causes of mechanical small bowel obstruction that led to abdominal emergency operation all over the globe. Among the bowel knotting, Ileo-sigmoid is commonest followed by Ileo-Ileal. Up-to-our literatures search there is a few cases but no literature review done on Ileo-Ileal knotting [1,2].

Small bowel obstruction is one of the commonest indications for abdominal exploration all over the globe. Among the commonest cause of abdominal emergency post operative adhesion rank first followed by volvulus in western and developing countries or vice versa. However, in less than 2% of patients present to emergency with mechanical small bowel obstruction from an extremely rare Ileo-ileal knotting [3,4].

The provoking factor for knotting of visceral organs is not exactly known. In fact, redundancy of organ and its mesentery, inflammatory adhesion of adjacent organs, wandering solid organ and hyperperistalsis from on rapid food load are the proposed mechanisms. Once it happens pathophysiology is a closed loop obstruction syndrome. Which result in rapid compromise of blood flow led to strangulation and gangrenous of involved bowel segment [5,6].

Patient clinical presentation of knotting is a disproportionate acute severe crampy abdominal pain over short duration. In general diagnosis is of knotting (Ileo-Ileal, Ileo-Sigmoid, Appendico-

Ileal and spleno-Ileal) need high index of clinical suspicion with supportive imaging evidence. However, the definitive diagnosis is intraoperative up on exploration [7].

Once clinically suspected urgent surgical exploration is crucial to halt further dissemination of systemic sepsis from progressively gangrenous knotted bowel. A recommended surgical management is enblock resection of knotted bowel segment proximal to the knot site and restoration of bowel continuity [8-11].

2. Case Presentation

2.1. History and Physical Examination

This is a 60-year-old male patient presented to our hospital with severe crampy abdominal pain of twelve hours, associated with failure to pass faeces & flatus, progressive mild abdominal distension, frequent bilious vomiting and low-grade fever. Otherwise, no history of trauma and prior abdominal surgery. Otherwise, no pertinent past medical and surgical history.

On physical examination, acute sick looking. vital signs; PR-(112-130) beats/min, RR-(24-29) breath/min, BP-(93/58-100/61) mmHg, T-(37.6-38.9) C⁰, SO₂-(93-99) % with atmospheric air. Pertinent findings were on- HEENT; dry buccal mucosa. Abdomen; diffusely tender and distended abdomen, decreased bowel sound and empty rectum on digital examination.

2.2. Investigations

Laboratory blood work ups; Complete blood count-WBC-12x10³, Neutrophil predominance -88% Hgb-11.3g/L, Platlet-374x10³. Serum Cr-1.0mg. Plain abdominal X-ray showed centrally located multiple air fluid levels and absent rectal gas shadow, suggestive of complete small bowel obstruction (Fig-1).



Figure 1: Plain Abdominal X-Ray Shows Multiple Centrally Located Air-Fluid Levels with Abscent Rectal Gas Shadow.

2.3. Management Outcomes and Follow Ups

After possible preoperative optimization, patient was counselled by surgeon for exploratory laparotomy. With impression of peritonitis secondary to gangrenous small bowel obstruction secondary to small bowel volvulus. Unfortunately, intraoperatively the finding up on midline exploration was frankly gangrenous Ileo-Ileum knotting. There was approximately 500ml haemorrhagic fluid sucked out from general peritoneum, dilated proximal & collapsed

distal bowel. Proximal Ileum wrapped double round the loop of adjacent distal Ileum loop segment (Fig-2). The outer loop of Ileal segment was strangulated and the inner segment of the Ileal loop was frankly gangrenous (Fig-3). About 50cm of distal Ileum from the Ileo-caecal valve was the total length involved in the knotting. After thorough exam enblock resection of knotted bowel and end to end Ileo-Ileal anastomosis was done.

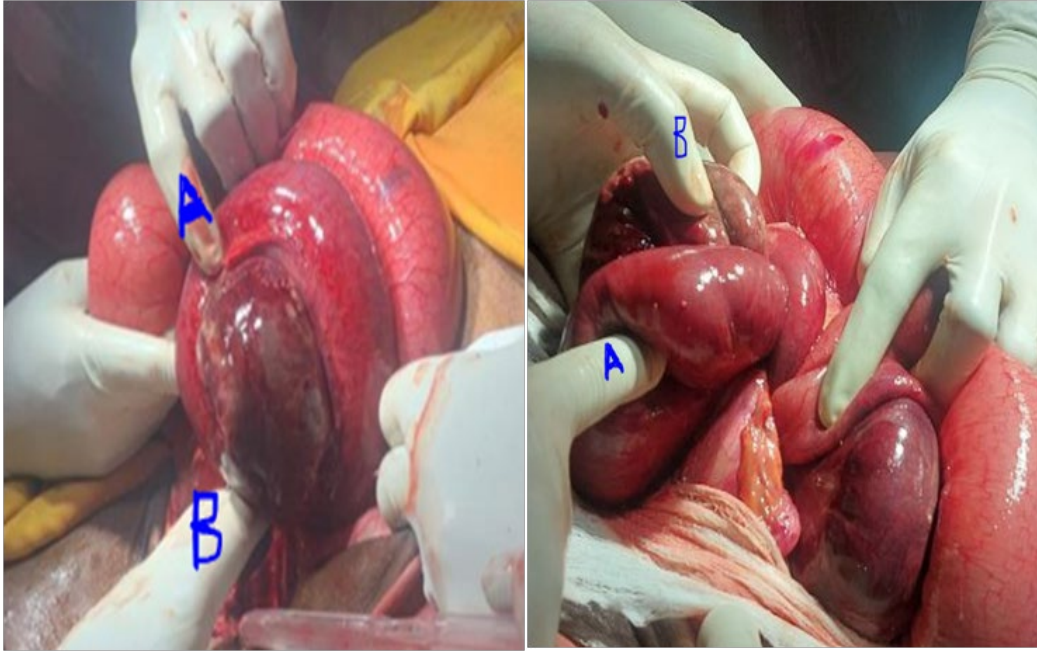


Figure 2: Intraoperative Photography shows Ileo-Ileal Knotting A) Ileal Segment Single Knotted/Outer Segment/Strangulated B) Ileal Segment of Double Knotted/Inside Segment/Frankly Gangrenous.

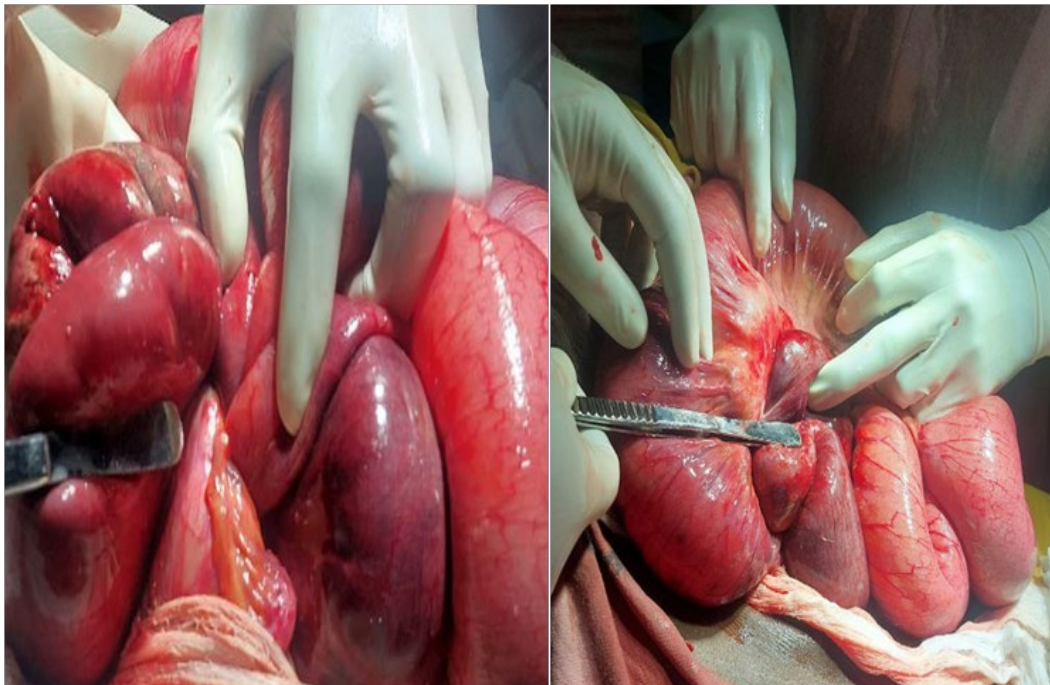


Figure 3: Intraoperative Photography shows Ileo-Ileal Knotting A) Gangrenous Distal Limb of Ileal Segment in the Ileal Knot B) A Proximal Limb of Ileal Segment Wrapped Double on the Distal Segment of the Ileal Knot.

Post operatively patient was treated with on broad spectrum antibiotics and regular analgesia and started feeding on second day. Subsequently she was discharged at 7th post operative day with significant improvement and doing well at third month post operative follow up.

3. Differential Diagnosis

Among all strangulated mechanical small bowel obstruction, the closed loop syndrome is the most devastating mechanism leading to fast progression to gangrenous. All causes of mechanical small bowel obstruction resulted in strangulation are potentially a differential diagnosis. In a high index of clinical suspicion of bowel knotting; Ileo-Sigmoid, Appendico-Ileal knotting, Spleno-Sigmoid knotting are more closely related differentials for Ileo-Ileal knotting to consider. Surprisingly no specific differential diagnosis to list as top one for bowel knotting.

4. Discussions

Small bowel obstruction is the leading cause of emergency abdominal operation worldwide. However, bowel knotting as a cause of small bowel obstruction is extremely rare clinical condition. Despite its rarity Ileo-Ileal knotting date back to sixteen centuries by Riverius followed in 1836 by Rokitansky in literature [1-3]. Since then, different bowel knotting was described of which Ileo-sigmoid is the most common followed by Ileo-Ileal knotting. As per our literature search knowledge there are few case reports exist on the globe and no review done. Generally, bowel knotting has a mortality rate of as high as 50% and rate of survival is depends on many factors mainly level of systemic bacterial dissemination from gangrenous bowel and length of small bowel involved in the knotting [4-7].

The predisposing factor for knotting of visceral organs is not exactly known. However, the redundancy of organ and its mesentery, inflammatory adhesion of adjacent organ, wondering solid organ and hyperperistalsis from on rapid food load are the proposed risk factors. In the bowel knotting pathophysiology is a closed loop obstruction syndrome, leading to rapid compromise of blood flow and venous return to the knotted loop result in further strangulation and gangrenous of involved bowel segment. In case of Ileo-Ileal knotting one loop of Ileal segment wrap around the base of another adjacent Ileal loop making different pattern of Ileal knot. The more inner level and multiple wrapped Ileum the fast progression to gangrenous level [8-11].

Diagnosis of any bowel knotting pattern is not as an ordinary small obstruction clinical feature. Thus, its' difficult to diagnose preoperatively even with the help of advanced modern imaging modality [12]. Patient clinical presentation is often a disproportionate acute severe crampy abdominal pain over short duration. In general diagnosis is of knotting (Appendico-Ileal, Ileo-Ileal, Ileo-Sigmoid and spleno-Ileal) need high index of clinical suspicion and supportive evidence of complete bowel obstruction on X-ray, transition point CT-scan. The definitive diagnosis is intraoperative up on surgical exploration [13,14]. Surgical management of Ileo-Ileal knotting is generally enblock

resection of involved Ileal segment with restoration of bowel continuity and strict control of toxic substance and bacterial dissemination during resection [13-15].

5. Conclusion

Thus, in patients with clinical evidence of strangulated bowel obstruction. Ileo-Ileal knotting should be considered as a differential diagnosis. Once Clinically suspected urgent surgical exploration is crucial to halt a further systemic dissemination of toxic substances and bacterial from rapidly progressive gangrenous bowel. The goal of surgical management is enblock resection of involved bowel segment proximal to the knot point with restoration of bowel continuity and strict control of systemic toxic substance and bacterial dissemination during resection. Mainly, outcomes depend on level of systemic sepsis dissemination and length of small bowel involved in the gangrenous knot.

Authors' Contributions

All authors had involved in the process of edition and approved the final manuscript document

Tewodros Tadesse Tessema - Conceptualization, supervision, data curation, validation

Murtii Teresa Obolu- writing original draft, review editing, data curation, Software

Abdullahi Mohamed - Conceptualization, review editing, data curation, Methodology

Tadesse Getachew Mulisa- Data curation & investigation

Gebril Ahmed- Data curation & Methodology

Gediyon Getachew - Data curation & investigation

Informed Consent

Formal written informed consent is taken from parents for publications along with accompanying images, any identification part has been anonymised for the privacy and confidentiality of patients and it will be available up on request by journal chief editor.

Funding

No financing.

Conflict of Interest

No conflict of interest in computation.

Acknowledgements

We would like to express our gratitude to the patients' parents for providing informed consents for publication along with accompanying image and everyone else who helped with the intraoperative photo and the radiologic image collection.

References

1. Kaushik, R., & Punia, R. S. (2020). Ileo-ileal knotting: an unusual cause of intestinal obstruction. *Tropical Gastroenterology*, 40(1), 41-43.
2. Rajesh, A., Rengan, V., Anandaraja, S., & Pandyaraj, A. (2019). Ileo-ileal knot: a rare cause of acute intestinal obstruction. *ANZ Journal of Surgery*, 89(12).

3. Otuu, O., Eni, E., & Chiedozie, O. A. (2021). Ileo-ileal knotting: an unusual cause of acute strangulated intestinal obstruction. *J Case Rep Images Surg*, 7, 100088-100.
4. Raveenthiran, V. (2001). The ileosigmoid knot: new observations and changing trends. *Diseases of the colon & rectum*, 44, 1196-1200.
5. M. W. H Mallick, Ileosigmoid knotting.
6. Taniguchi, K., Iida, R., Watanabe, T., Nitta, M., Tomioka, M., Uchiyama, K., & Takasu, A. (2017). Ileo-ileal knot: a rare case of acute strangulated intestinal obstruction. *Nagoya Journal of Medical Science*, 79(1), 109.
7. Abule, T., Chebo, T., & Billoro, B. B. (2022). Appendico-ileal knotting causing small bowel obstruction: A case report. *Clinical Case Reports*, 10(5), e05878.
8. Okello, M., Kharono, B., Mwaka, E., & Lock, G. (2016). Appendico-ileal knotting mimicking adhesive bowel disease. *Zeitschrift für Gastroenterologie*, 54(04), 316-318.
9. Bayleyegn, N. S., Zelelew, A. N., & Sisay, A. L. (2024). Evaluation of clinical profiles, surgical experience and outcomes of ileosigmoid knotting in low-resource setup: A retrospective cohort study at Jimma University Medical Center. *World Journal of Surgery*.
10. Ooko, P. B., Saruni, S., Oloo, M., Topazian, H. M., & White, R. (2016). Ileo-sigmoid knotting: a review of 61 cases in Kenya. *Pan African Medical Journal*, 23(1).
11. H, M. My Beg., L, Bains., P Lal. Small bowel knots.
12. Kabuye, U., Damulira, J., & Okuku, M. D. (2024). Appendico-ileal knot: A rare form of small bowel obstruction: A case report. *International Journal of Surgery Case Reports*, 123, 110194.
13. Fekadu, G., Tolera, A., Beyene Bayissa, B., Merga, B. T., Edessa, D., & Lamessa, A. (2022). Epidemiology and causes of intestinal obstruction in Ethiopia: a systematic review. *SAGE Open Medicine*, 10, 20503121221083207.
14. Molla, Y. D., Mequanint, M. B., Bisrat, S. H., Workneh, G. A., & Alemu, H. T. (2024). Ileo-ileal knot causing acute gangrenous small bowel obstruction: a case report. *Journal of Medical Case Reports*, 18(1), 72.
15. Mohammed, Y., & Tesfaye, K. (2021). Ileoleal knotting: a rare cause of intestinal obstruction: a case report. *Journal of Medical Case Reports*, 15, 1-3.

Copyright: ©2025 Murtii Teressa Obolu, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.