



Anatomical Variations In Ileo Sigmoid Knot: Our Experience At Iyi-Ewu Hospital (A Suburban Hospital Near Onitsha, Anambra State) Nigeria - Case Report

*A.I. UGOCHUKWU¹ AND N. NWOBODO²

¹Department of Anatomy, College of Health Sciences, Enugu State University of Science and Technology, Nigeria.
²Department of Physiology, College of Health Sciences, Enugu State University of Science and Technology, Nigeria.

*Author for correspondence

ABSTRACT

Five patients presented or referred with acute intestinal obstruction caused by Ileo-sigmoid knot at Iyi-Ewu Hospital Ogidi, a suburban hospital near Onitsha, Anambra State, Nigeria between October 1997 to June 2002 are described. All were blacks of Ibo tribe of South East Nigeria in the West African sub-region, indicating that this condition can also be seen in blacks of West Africa as well. Existence of the disease had been reported extensively in blacks of Southern and East Africa, in many series; (Kallio 1932, Faltin 1938, Burkit 1960 and Hall-Craggs 1960). The incidence of the disease may be the same in all three regions (West, East, and Southern Africa). Owing to its complex nature correct pre-operative diagnosis was only made in one patient who had a typical radiological appearance of Ileo-sigmoid knotting (Compound Volvulus). Three of the patients were referred to us, one after gridiron incisional exposure for appendectomy, one after lower midline vertical laparotomy exposure for supposed small bowel obstruction from adhesion, the third after upper midline vertical laparotomy exposure for supposed perforated duodenal ulcer with peritonitis. On the fifth patient correct pre-operative diagnosis was not made before operation. The possible aetiologies, anatomical variations and operative techniques are discussed; as well as the inherent problems in further management of the referred patients by doctors inexperienced in dealing with complex surgical entity *ab initio*.

Keywords: Ileo-sigmoid Knot, Intestinal Obstruction, Laparotomy and Hyperactive Bowel.

Case 1:

A 35-year-old male was referred to our surgical unit by a junior medical doctor practicing in a private hospital in Onitsha, in October 1997. He had opened up the patients abdomen through a gridiron incision for appendectomy only to find profuse haemorrhagic peritoneal exudates and a loop of gangrenous bowel. He quickly closed the wound and as soon as the patient recovered sufficiently from anaesthesia, was referred to our unit. He had a history of sudden onset of central abdominal pain, which rapidly became profuse and intense with the intensity most marked in the lower abdomen; associated with profuse vomiting. Examination on admission into our unit showed moderately shocked and drowsy (effect of anaesthesia) male with wound dressing on right iliac fossa and a rigid, distended abdomen and absent antibiotic cover laparotomy was undertaken. Massive haemorrhagic peritoneal exudates and ileo-sigmoid knot was found which involved the distal jejunum, proximal ileum and sigmoid colon. These bowel loops were resected *en bloc with primary ileo-*

jejunal anastomosis and terminal left iliac colostomy and mucus fistula fashioned. The appendix was normal and was not resected. Patient made uneventful recovery and was discharged on the 11th post-operative day. The colostomy was closed four months later.

Case 2:

A 47-year-old black male was referred to our surgical unit in March 1998 after undergoing a laparotomy under non-relaxing anaesthesia (I.V Ketamine) through an upper vertical midline incision for suspected perforated duodenal ulcer with peritonitis. The operating distended, gangrenous bowel. Owing to inexperience as to what to do, he quickly closed the abdomen, after partial decompression of the distended bowel loops using multiple needle aspiration, to enable him close the abdomen. The patient was brought to us 12 hours later. On admission, he was severely shocked, semi-conscious (combined effect of shock and anaesthesia). He had a grossly distended abdomen with board-like rigidity. Bowel sounds were absent. He had poor urinary output on urethral catheterization. Intensive resuscitation

was embarked upon with large volumes of intravenous fluids, blood transfusion and I.V. bolus of Frusemide, I.V. Flagyl and Rocephin were administered. When his general condition improved, somewhat, he had a re-laparotomy where haemorrhagic, faeculent smelling peritoneal exudates were observed as well as ileo-sigmoid knot. The knot was resected en bloc, ileo-jejunal primary anastomosis and left terminal colostomy and mucus fistula were established.

On the 6th post-operative day, he was found to have developed intra-abdominal abscess, which would not respond to initial conservative management. He underwent yet another laparotomy and found to have massive paracolic and pelvic abscesses. These were drained and low-pressure suction drainage tube (Redivac) inserted into the pelvis and sub-hepatic areas. Post-operatively due to over-whelming and continuing sepsis, he went into septic shock and died on the 10th post-operative day.

Case 3:

A 54-year-old black male was admitted into our surgical unit in July 1998 with sudden onset of severe abdominal pain and vomiting which was profuse. He was moderately shocked, had board-like abdominal rigidity, guarding and absent bowel sounds. A plain x-ray of abdomen showed the typical features of volvulus.

After adequate resuscitation, laparotomy was undertaken: an ileo-sigmoid knot with gangrenous loops pelvic colon and small bowel were found. The knot was excised 'en bloc' and ileo-jejunal primary anastomosis with terminal left iliac colostomy were constructed. The rectal stump was closed around a tube drain, which was led out par rectum. He made an uneventful post-operative recovery and was discharged on the 11th post-operative day with a good functioning colostomy. Three months later he had a successful colorectal anastomosis performed.

Case 4: A 30 year old black female was referred to us in March 2001 from our gynecological unit having been diagnosed as having twisted large left ovarian cyst. However, plain abdominal X-

ray showed multiple air/fluid levels and dilated small and large bowel loops. He has had previous history of recurrent colicky abdominal with vomiting occasionally and which usually subsides spontaneously.

On examination, she was found to be moderately shocked, in severe painful distress with moderately distended rigid abdomen, guarding and absent bowel sounds. After adequate resuscitation, laparotomy was undertaken. Massive haemorrhagic peritoneal fluid and Ileo-sigmoid knot with gangrenous loops of small bowel and sigmoid colon were found. Ileo-Ileal anastomosis was performed with terminal left iliac colostomy left iliac colostomy and mucus fistula. The patient made an excellent post-operative recovery and was discharged on the 10th day post-operatively and she had an uneventful closure of the colostomy by colorectal anastomosis 5 months later.

Case 5:

A 50 year-old black male was referred to our surgical unit in June 2002 from a private hospital after having had laparotomy through a lower vertical midline incision for supposed small bowel intestinal obstruction caused by an adhesion. However, having noticed large volumes of haemorrhagic peritoneal fluid and large loops of gangrenous bowel, the doctor decompressed the distended gangrenous loops of bowel with multiple needle aspirations to enable him close the abdomen. At re-laparotomy, large volumes of faeculent smelling haemorrhagic peritoneal exudates and Ileo-sigmoid knot were found. The knot was excised 'en bloc' and Ileo-jejunal primary anastomosis and terminal left iliac colostomy and mucus fistula were fashioned. He did well post-operatively and was discharged on the 12th post-operative day.

DISCUSSION

The patients in our series presented some of the complex issues associated with this rather uncommon surgical entity. The mechanism of ileo-sigmoid knotting is now well established and described by Shepherd (1987). Ileo-sigmoid knotting is initiated as a hyperactive loop of small intestine descends into the left paracolic gutter to

encircle the sigmoid colon in an anticlockwise or clockwise direction. As the knot tightens the bowel obstructs forming a double closed loop and the associated mesenteric twisting leads to thrombosis of Ileal artery (branch of Superior Mesenteric arterial tree) and Sigmoid artery (branch of Inferior Mesenteric arterial tree). Then strangulation of entrapped closed bowel loops occur leading to their early gangrene. Massive haemorrhagic peritoneal exudates pour out into the peritoneal cavity. Symptoms develop rapidly with severe abdominal pain, abdominal distension is rapid and vomiting profuse. Shock is intense and rapid in onset as a result of large volumes of trapped blood in the strangulated loops and in the peritoneal cavity. Bacterial invasion of the peritoneal cavity from devitalized trapped loop of bowel occurs early.

Weinberg (1968) and Visser (1993) noted that the loop of ileum, which becomes hyperactive does so after a large meal of carbohydrates or a drinking spell. The aetiology of Ileo-sigmoid knot remain controversial but there is no doubt that geographical, racial, age and sex factors appear to be important. Many authors have shown evidence of the high incidence of this condition in East Africa and its very low incidence in Europe and North America. Our series highlights the fact that this condition may be as common in West Africa as it is in East and Southern Africa. In all these reports, it is much more common in males (especially 30-35 age group) than in the female; M:F ratio given as 5:1. Our series has four males and one female in a data collection over five years; M:F ratio given as 4:1 and this is in agreement with other reports.

Cases 2 and 4 were working as executives in their offices at the time of onset of symptom and none had heavy meal or drinking spell. These findings do not agree with those of Weinberg (1968) and Visser (1993), who considered that a relaxed abdominal wall particularly during sleep and following large meal and or drinking spell and post-partum were of significant aetiological factor. It seems to us, that the inherent anatomical configuration of the small intestinal mesentery on whose free edge runs the ileal loop

to descend into the left paracolic gutter and initiate the process of Ileo-sigmoid knotting. This is in agreement with postulation by Scott (1983) who reported that generally Africans have narrower and longer small bowel mesentery.

In our series plain x-ray of abdomen was not helpful in making a pre-operative diagnosis except in case 3. Ultrasonography though helpful in localizing the site of pelvic abscess in case 5, could not localize the equally large paracolic abscess cavities. This limitation in value of ultrasound in detecting para-colic abscesses especially in the early post-operative period is in agreement with the finding in other series as reported by Irving (1992)

Once the diagnosis is made, the operative management of Ileo-sigmoid knot is straightforward. In most cases seen in Africa and particularly in our series where the patient presented late the distended trapped loops of small bowel and sigmoid colon were gangrenous and in all such cases 'en bloc' excision of the compound volvulus, followed by primary anastomosis of the small bowel and left iliac colostomy and mucus fistula is clearly the surgical procedure of choice as was done in our series.

Deflation of distended loops followed by unknotting is clearly dangerous since it will release large volumes of toxins into the general circulation leading to uncontrollable septicaemia and septic shock; Wapnick (1973) and Shamblin (1985). No doubt, the multiple needle aspirations of distended gangrenous bowel loops in attempt a bowel decompression, and the consequent faecal contamination of peritoneal cavity contributed significantly to the fatality and high morbidity in cases 2 and 5 respectively.

Fortunately, in our series the length of small bowel resection was not enough to cause malabsorption when these patients were followed up for up to one year. This corroborates with the findings in other series; Hsu (1979) and Roy (1973).

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