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Adult Intestinal Intussusception: Bibliographic Review, Diagnostic and Therapeutic Care in Tropical Region

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ABSTRACT

Intestinal intussusception in adults is a rare entity unlike in infants and young children. It is often secondary to a tumor of the intestinal wall. The aims of this study were to describe the particularities of acute intestinal intussusception in adults through observations and to study the diagnostic difficulties in a tropical region. This is a retrospective, descriptive study carried out in the surgery department at the Andrainjato University Hospital over a period of tow year from July 2021 to October 2023 covering five cases, including patients admitted during the study period, aged over 18 years. The average age of the patients was 38.6 years; there were more men than women. The reasons for consultation were abdominal pain in 80%. The average time for symptoms to evolve was 30 days [7-60]. Preoperative diagnosis is difficult. Abdominal ultrasound and abdominal Computed Tomography (CT) were helpful in 40% of cases. An intestinal resection anastomosis was carried out in 80% of cases and a left hemicolectomy in 20% of cases. The postoperative course was straightforward in all patients. The etiology was in 80% of cases dominated by adenocarcinoma.

Keywords: Adult, Intestinal intussusception, Abdomino-pelvic CT scan, Adenocarcinoma, Surgical treatment

1. Introduction

Adults' intestinal intussusception represents only 1% of intestinal obstructions. An organic cause is found in 70% to 90% of cases, with 65% of neoplastic cause in particular[1], whereas in children, 90% of cases are idiopathic[2].

Acute evolution in adults in the face of an occlusive syndrome or generalized peritonitis is a rare presentation[3], which explains why preoperative diagnosis of intestinal intussusception in adults is difficult and most often performed by laparotomy method[4]. Lebeau[3] noted in his study that the average diagnosis time is 6 days, with extremes ranging from 2 to 21 days.

However, laparotomy itself may be delayed in developing countries such as Madagascar by attempts at traditional treatment, and evacuation conditions for rural patients to surgical department are difficult, whereas a delay in diagnosis is the primary major prognostic determinant of intestinal intussusception in adults[5]. Treatment in adults is purely surgical, and anatomophatology is necessary to confirm the etiological diagnosis.

The aim of this study was to report new observations by enumerating the cause and to describe the particularities of management in a tropical region.

2. Materials and Methods

We carried out a retrospective, descriptive, mono-centric and single operator study that covered the period from July 1, 2021 to October 30, 2023 on cases of intestinal intussusception in adults aged over 18 years who underwent surgery in the surgical department at the CHU Andrainjato.

The observations on which this work was based were reconstructed from:

- Admission and discharge registers.
- Operation report registers.
- Hospital ward records.

3. Observation

During our study, we observed 5 cases of intestinal intussusception in adults over 18 years of age.

4. Results

4.1. Case No: 01

A 29-year-old female patient with no previous history was admitted for chronic abdominal pain in the epigastrium and then in the right iliac fossa, radiating to the back, with no calming factor. The pain had been evolving for 2 months in an apyretic context, with altered general condition such as anorexia and loss of 17 kg in 2 months. For two weeks, the pain had been associated with iterative yellowish vomiting that did not follow the rhythm of a meal, with no cessation of gas or matter, but with moderate amounts of blackish blood. Physical examination revealed marked abdominal bloating. An unprepared abdominal X-ray showed dilatation of the small intestines without any particularities. Colonoscopy suggested a non-stenosing ulcerating tumor in the right colon, and the abdomino-pelvic CT scan showed a thick right-sided colo-colonic intestinal intussusception down to the level of the left colonic-angle (Figure 1).

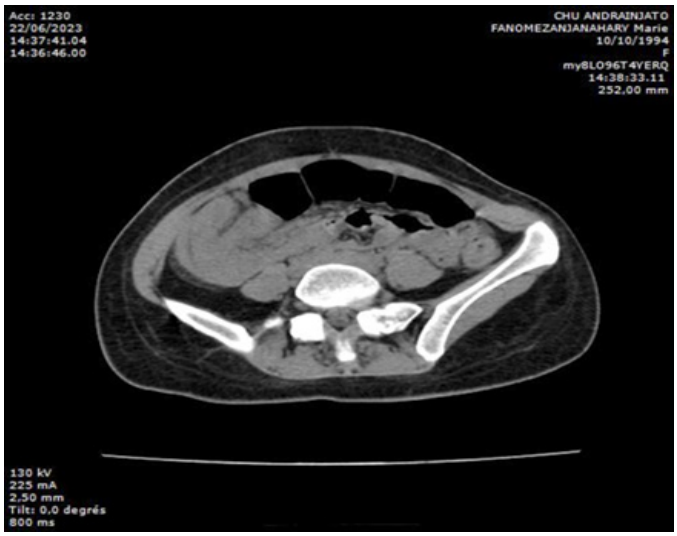

Figure 1: Abdomino-pelvic CT scan: right-sided colo-colonic intussusception with a thickened lead point, extending proximally to the left colic angle.

Surgical exploration revealed an intussusception extending to the left colonic angle (Figure 2). After manual deinvagination, there was no tumor or loco-regional adenopathy. However, a superficial ulceration associated with parietal thickening of the terminal ileum 10 cm from the ileocecal junction was observed. A wedged-shaped resection of the ulcerated area for histological examination was performed, followed by terminal ileo-ileal anastomosis. Pathological examination of the operative specimen revealed no pathological findings, apart from infiltration of the mucosa into the submucosa and musclaris propria, with the presence of a large, deep ulcer with no signs of malignancy (Figure 3). Postoperative treatment was straightforward.

Figure 2: Intraoperative findings confirmed an intussusception extending to the left colic angle.

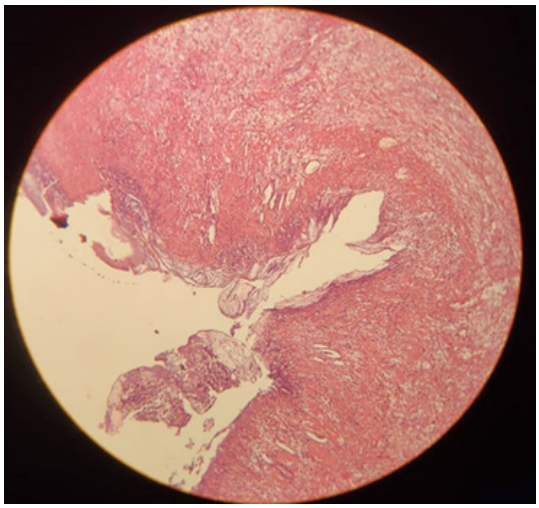

Figure 3: Histology of the surgical specimen revealed no malignancy, only mucosal infiltration into the submucosa and muscularis, with a deep ulcer and no signs of cancer

4.2. Case No: 02

A 48-year-old peasant patient with a history of bloody mucus diarrhea three months prior to admission was seen in the emergency department for colicky abdominal pain around the umbilicus, of low intensity and progressive onset, which had been evolving for 10 days after consultation with a traditional healer. A worsening of the pain, which became diffuse and intense, was noted five days prior to admission, associated with gas and urine stoppages. Physical examination revealed abdominal bloating. Rectal examination was normal. An

unprepared abdominal X-ray showed a hydro-aeric level in the ascending colon, and abdominal ultrasound revealed significant dilatation of the intestinal loops, with no evidence of intestinal intussusception. Surgical exploration confirmed the diagnosis of colo-colic intussusception on a stenosing transverse tumor with suspicious infiltrating adenopathies (Figure 4). A left hemi-colectomy was performed with a temporary terminal colostomy, and histological examination of the surgical specimen revealed a moderately differentiated infiltrating adenocarcinoma pT3N1aM0 (Figure 5). Extension studies were carried out, but all came back negative. Postoperative treatment was also straightforward.

Figure 4: Colo-colonic intussusception due to a stenosing tumor of the transverse colon with suspected lymph node involvement.

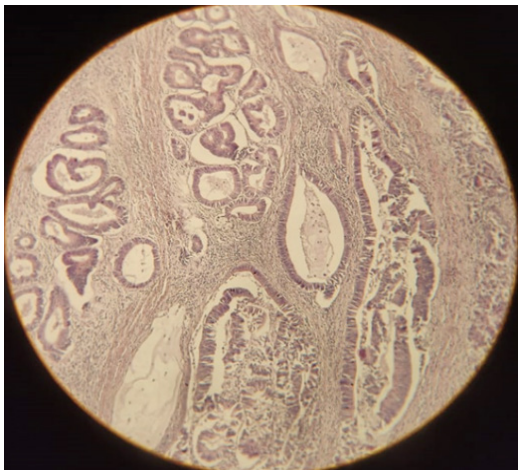

Figure 5: Histology of the surgical specimen confirmed a moderately differentiated infiltrating adenocarcinoma pT3 N1a Mx.

4.3. Case No: 03

A 43-year-old male farmer patient with a history of chronic smoking was admitted to the emergency department with paroxysmal abdominal pain that had been evolving for 13 days and then became intense, localized in the right iliac fossa, with no cessation of gas or liquids, and altered general condition with weight loss. The physical examination on admission showed acute abdominal distension with no palpable mass, and the rectal examination was painless. On removal, the finger prick showed a small amount of bright red bleeding. The unprepared abdomen revealed a hydro-aeric level and dilatation upstream of the left colonic angle, and suggesting an emergency intestinal obstruction syndrome. Surgical exploration revealed an acute colo-colonic intestinal intussusception in the descending colon over a partially stenosing tumor was resected 18 cm upstream and downstream., followed by a terminal anastomosis. The surgical specimen revealed moderately differentiated infiltrating colonic adenocarcinoma, stage pT2N0M0. Postoperative treatment was straightforward.

4.4. Case No: 04

A 30-year-old male farmer patient was admitted to the emergency department with paroxysmal abdominal pain of the right iliac fossa, torsion type without triggering factors, which had been evolving for 7 days after conventional treatment. It was associated with abundant dirty-brown vomiting and cessation of feces and gas for 4 days, all in an apyretic context. Initial physical examination revealed acute intestinal obstruction syndrome, diffuse abdominal guarding and a normal rectal examination. An unprepared abdominal X-ray showed dilatation of the small intestines and hydro-aeric levels of the small intestine. Abdominal ultrasound showed a large peritoneal effusion with no visible mass. Coeliotomy revealed acute intestinal intussusception 50cm from the ileocecal junction, with a large cluster of roundworms obstructing the intestinal lumen. The necrotic segment was resected, followed by terminal ileo-ileal anastomosis. Postoperative management was straightforward.

4.5. Case No: 05

A 43-year-old female farmer patient was admitted to the emergency department with a sudden onset of intermittent stabbing abdominal pain in the right hypochondryum and right flank, radiating to the right lumbar fossa, with no cessation of gas or bile, in an apyretic setting and altered general condition (loss of 12 kg in one month), which had been evolving for 2 months. A history of bloody mucus diarrhea one month prior to admission was noted. Palpation revealed a hard painless mobile mass in the right iliac fossa, suspected in the emergency room as an appendicular plastron. However, abdominal ultrasound showed a target and sandwich image in the sub hepatic area involving the terminal ileum, the right colon and down to the transverse colon, confirming the existence of a colonic ileocecal colic intestinal intussusception with multiple adenomegalies 10mm in diameter within the invaginated structures (Figure 6).

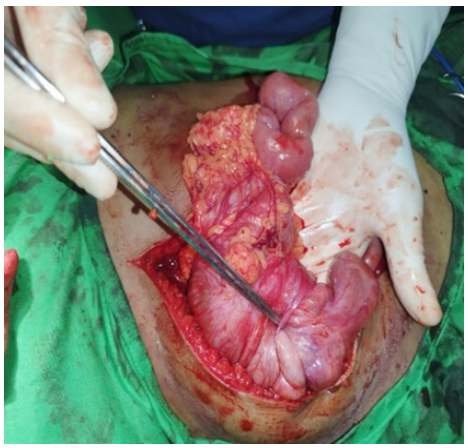

Figure 6: Acute colo-colonic intussusception located in the descending colon, secondary to a partially stenosing tumor.

Surgical exploration revealed a non-stenosing tumor invading the wall (Figure 7). A right ileocolic terminal-lateral anastomosis was performed. Histological examination of the operative specimen revealed an infiltrating, poorly differentiated colonic adenocarcinoma. Post-operative treatment was straightforward.

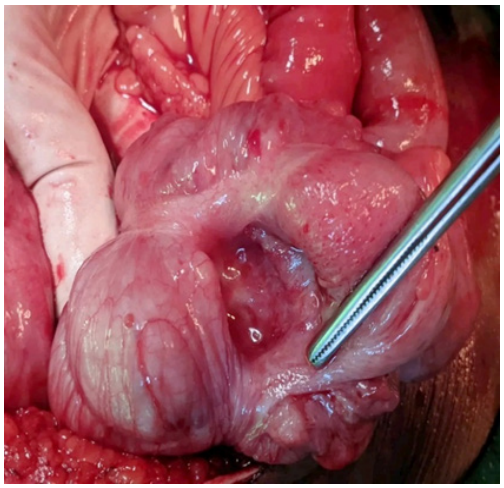

Figure 7: Non-stenosing tumor with wall invasion found on surgical exploration.

5. Discussion

5.1. Epidemiological aspects

In the one year, 5 cases of intestinal intussusception in adults were observed out of a total of 414 cases of acute intestinal obstruction. The rarity of this condition is mainly reported in Africa. A study by Traoré in 2016 with an incidence of 1.5 cases/year[6] and by James Didier et al in 2017 gave an annual frequency of 1.2 cases/year, which was the case for Barussaud et al in France (1.7 cases/year)[7,8].

While this pathology is rarely observed in developed countries, it is more marked in Africa, Asia and particularly intertropical zones such as Madagascar, confirmed by Chang, et al.[9] (3.5 cases/year in 2007) and Gupta, et al.[10] in India (5.3 cases/year in 2011). The reasons for these geographical differences are unknown, but factors such as diet and parasites have been cited, especially in tropical zones[11-14].

In our observations, the average age was 38.6 years, which was close to that of Lebeau[3], Traore[6] and Zida[11], but in the study by Barussaud in France[7] and Weilaecher in the USA[15], the average age was 51 and 58 years respectively. This age difference between African and Western patients can be explained by the predominance recorded during the study, i.e. 60% of cases with a sex ratio of 1.5, is confirmed by the studies of Drissa[6] (73.2% men), Ayite in Niger (53%)[17] and James Didier, et al.[8]. No explanation could be given despite the significant results observed by some authors[14,18].

5.2. Preoperative diagnosis

In the literature, preoperative diagnosis was made in only 40% of cases during our study was the case for Drissa et al in 2012 with a rate of 27%[2]. The preoperative diagnosis of intestinal intussusception was made in only 30% of cases[3]. In all cases, exploration in the operating theatre was required to confirm the diagnosis of intestinal intussusception, according to the study by Zoda in Burkina Faso and Ayiet in Niger[11,17]. However, Chang, et al.[9] evoked the diagnosis of acute intestinal intussusception in 89.1% of adults preoperatively. In the United States, Lorenzo, et al. mentioned it in 86% of cases respectively[19]. The rarity of the pathology, on the one hand, and the lack of specificity of the symptomatology, on the other hand, make preoperative diagnosis difficult.

And according to the literature, preoperative diagnosis is achieved in only around 45% of cases without Computed Tomography (CT)[10]. These differences can be explained by the inaccessibility of emergency CT scans. Abdominal ultrasound is of crucial importance in the diagnosis of acute intestinal intussusception in Children, but it is sometimes difficult to diagnose intestinal intussusception in adults. Its performance is limited by distension and digestive gases[3,20]. This is why abdominal CT is so useful for confirming the diagnosis, as it is an effective with an estimated accuracy of 66%-100%. At the same time, it allows us to determine the etiology, location and severity of intussusception in adults[21,22].

5.3. Diagnosis period

The average diagnosis period was 30 days, ranging from 7 to 60 days. In 60% of cases, our patients consulted late, and the delay between the onset of symptoms and diagnostic confirmation exceeded 2 weeks, as was the case for Sanogo, et al.[13]. A predominance of chronic forms evolving over more than 2 weeks was reported by Ayite, et al.[17]. According to Zida, et al.[11] the average delay between the evolution of symptoms and admission to the emergency department was 6.5 days, with acute forms predominating in 22 cases and chronic forms in 8 cases. The late consultation in our series could be explained by the chronic, intermittent and silent evolution of clinical symptoms. Only one case in our series had presented with an acute intestinal obstruction. On the other hand, 80% of our patients lived in isolated areas, which motivated them to try traditional treatment before consulting a doctor.

5.4. Evolution

The evolution was chronic in 60% of cases, as reported by Ayite and Traore[6,17], unlike the patients of other authors who presented acutely[3,23].

Classically in adults, intussusception progresses chronically, with intermittent abdominal pain associated with sub-occlusive crises[14]. Acute forms were the final stage of a chronic intussusception for which an early diagnosis had not been made.

The chronic presentation in our series may be explained by the predominance of colo-colonic forms, theorically giving noiseless clinical aspects that delay consultation with a physician. This is confirmed by Ayité and al in Niger, where colonic intussusception is never occlusive on entry[17].

For Otteni F, et al.[23] the acute forms of intestinal intussusception are ileo-ileal or jejuno-jejunal. According to other authors, IIA is a chronic disease that can be complicated by acute accidents in adults[17].

5.5. Diagnosis

The classic signs of intestinal intussusception-paroxysmal abdominal pain, bloody diarrhea and palpable mass on examination-are found in children, but are very rarely seen in adults. In our series, only a quarter of patients presented with these signs. Despite IIA being a rare cause of abdominal pain[20], the majority of our patients were seen in the emergency department for abdominal pain of a periodic nature, as was the case for Lebeau, et al.[3] in 2006 and Didier James et al. [8], in 2017. Vomiting and altered general condition were also noted in two-thirds of our patients, which may be explained by the frequency of malignant lessons in our study series. Vomiting

was noted in 60.7% of patients and impairment of general condition was in 55.2% of cases, while on 2 patients (5.26%) were malignancy carriers according to Ayite, et al.[17]. Three of our patients (60%) presented with cessation of gas and matter; these results are lower than those reported in other series[8,11].

In 2 cases in our series, the digital rectal examination confirmed the existence of bloody mucus, confirming a rectorrhagia, which is an excellent sign of intestinal distress[18] and linked to intestinal parasitosis. Complementary examinations are essential to confirm the diagnosis and search for etiologies preoperatively. In our series, abdominal ultrasonography was performed in all patients, and only one case showed a target image, which is similar to the study reported by Didier and Sanogo, who reported by that ultrasonography performed in a third of cases revealed a "target" image, suggestive of intestinal intussusception. On the other hand, the study by Drissa and al showed that ultrasound was performed in 12 out of 41 patients; it objectified the intussusception sulcus in 11 cases[2,8,13], whereas ultrasound confirmed the diagnosis of intussusception in 85.7% of cases according to the study by Lorenzo, et al.[19].

According to some American authors, the ultrasound image in favor of intestinal intussusception is found in 50%, 85.8% or even 92% of cases[24]. The low rate of ultrasound diagnosis in African studies compared with Western studies may be explained by the difference in quality of ultrasound material used. Colonoscopy revealed a non-stenosing intraluminal tumor in the terminal ileum; only CT-scan showed the intestinal bulge as a sandwich in transverse section[18].

The use of flexible fibroscopy and colonoscopy in cases of IIA is mainly in the sub-acute and chronic evolution of the condition, enabling biopsies to be taken in order to establish the etiology, but for positive diagnosis there is no typical image[24]. In most cases, the intussusception sulcus immits budding and stenosing tumoral lesions, as in our case.

5.6. Antomical lesions

In our study, only one case was recorded for ileo-ileal IIA, in two-thirds of cases the mixed form and the chronic form were the most frequent. This was not the case for Traoré and Ayité, as ileo-ileal intussusception was the most frequent form, accounting for 39% and 65% to 75% of cases respectively[6,17]. This could be related to the predominance of malignant lesions in our series, as colonic and ileocolic intussusceptions are often of malignant origin[3,18,23].

5.7. Etiologies

Among these malignant lesions, 3 patients in our study presented with adenocarcinoma, i.e., 60% which was less than that reported by Lebeau, et al.[3] 74% but close to that of Traore, et al.[6]. The onset of adenocarcinoma in our patient was early, with an average age of 44.6 years, whereas Hasbi and Weilbaecher's patients were all over 56 years of age[15,25]. According to the literature, the age of onset of adenocarcinoma of the intestine varies between 63.5 and 67 years[26]; this difference can be explained by the early and multiple exposure to risk factors for the onset of adenocarcinoma reported by Zaanan, et al.[26] such as dietary habits, farming, smoking and consumption of strong alcohol, which were found in our patients.

According to Hasbi, et al.[25] adenocarcinomas are often diagnosed at an advanced stage. An occlusive syndrome is the most frequent reason for consultation[25]. This was not the case in our study, which was dominated mainly by paroxysmal abdominal pain associated with altered general condition. One patient in five had been diagnosed as IIA, which is rarely observed in elderly subjects[14]. The last patient presented with IIA on a roundworm plug reported mainly by African authors[12].

5.8. Treatment

Treatment is strictly surgical in adults, and an attempt at deinvagination by hyper pressure should be contraindicated due to the frequency of tumor lesions. While Matsui, et al.[27] ad demonstrated efficacy with barium enema, they conclude that air enema reduction is effective in treating idiopathic intussusception within 24 hours of the inset of clinical signs in young, healthy adult patients. Barussaud, et al.[7] prove the contrary, as in their study series they tried radiological reduction by barium enema but were unsuccessful, and the patient underwent surgery a few hours later.

We performed a preliminary deinvagination in 80% of cases, enabling us to better appreciate the limits of the resection in the absence of an extemporaneous examination, which was not the case for Lebeau at al. because a monobloc resection was necessary due to the frequency of malignant tumors in their case[3]; an anastomotic resection was performed in 4 cases, similar to those of Drissa and al.[2], sometimes exposing the patient to a short small bowel syndrome[3]. Only one patient had undergone hemicolectomy of the descending colon, followed by deferred restoration of continuity for an adenocarcinoma with multiple lymph node invasion, and manual deinvagination had been prohibited because of the risk of metastatic dissemination. This procedure is estimated to be the primary cause of longer hospital stays[11].

According to Western Authors, all patients with significant comorbidities, severe inflammation or intestinal edema surrounding the intussusception should benefit from resection with stoma rather than primary anastomosis. According to some authors, manual deinvagination without resection is deemed necessary if there is no tumor lesion, or if the invagination is discovered early without segmental necrosis[3,6,17].

At present, laparoscopy is playing an important role both diagnostically and therapeutically, improving prognosis and hospitalization times. According to Siow and al, laparoscopic management of acute intussusception is comparable to open surgery[28], but is often limited by the fact that in our center, the use of minimally invasive laparoscopy is not yet available, and the risk of perforation of the intestinal loops is greater than the frequency of intestinal obstructions.

With regard to adenocarcinomas, the role of adjuvant chemotherapy after surgery has yet to be demonstrated[25].

5.9. Prognosis

Despite the delay in diagnosis and treatment, no complications were reported during our study and no deaths were recorded. This was also the case for Sanogo[13] and Chang[9], but not for Barussaud and Ayite, who had mortality rates of 16% and 29%[7,17].

According to Barussaud, the high number of tumor causes may explain the mortality rate.

But for Ayite, the time wasted with traditional healers, the difficulties of evacuating rural patients, and the consequent

deterioration in general condition, were responsible for high mortality.

Mortality from intestinal intussusception in adults is estimated at 9% to 50%, depending on the clinical form, terrain, severity and etiology[11,13]. It is linked to the patient's condition, the underlying disease, and the possibilities of early diagnosis and therefore rapid surgical treatment.

Mortality in our series is series certainly underestimated due to the short follow-up period.

6. Conclusion

Intestinal intussusception is a rare entity, difficult to diagnose in adults due to clinical polymorphisms, requiring strong clino-radiological suspicion, hence the importance of an abdomino-pelvic CT scan. According to the literature, treatment is purely surgical but laparoscopy could become the gold standard or the treatment of IIA in adults, due to its safety and reliability. Prognosis depends above all on early diagnosis and appropriate therapeutic management.

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