








# Association between Intestinal Intussusception and Metastatic Cutaneous Melanoma - Case Report

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**Abstract:** The acute obstructive abdomen accounts for approximately 20% of emergency surgeries. Intussusception, a type of intestinal obstruction, is more common in children and is typically associated with benign conditions. On the other hand, in adults, intussusception is often associated with an invagination point, in most cases a malignant tumor responsible for altering peristalsis and resulting in invagination of the proximal intestine into the lumen of the distal intestine. This report describes the case of a 40-year-old woman with metastatic cutaneous melanoma who experienced two episodes of intussusception and underwent exploratory laparotomy twice. In both cases, enterectomy with primary anastomosis was performed.

**Keywords:** Intestinal Intussusception, Melanoma, Acute Abdomen

## Introduction:

Mechanical obstruction of the small intestine is a common cause of acute abdomen<sup>1,2</sup>. It accounts for 2 to 4% of emergency admissions, approximately 15% of hospital admissions, and 20% of emergency surgeries related to abdominal pain<sup>3,4</sup>. The incidence of small bowel obstruction is similar between men and women, with women representing 55% of the cases. The average age of patients hospitalized for their first episode is 68.5 years<sup>5</sup>, and the small intestine is involved in 76% of cases<sup>6</sup>. Additionally, intestinal ischemia, a significant complication, occurs in 7 to 42% of intestinal obstructions and substantially increases associated mortality rates<sup>7</sup>.

In the United States and Western Europe, adhesions are the primary cause of mechanical small bowel obstruction, followed by tumors and complicated hernias<sup>2, 6, 7</sup>. Less frequent causes include Crohn's disease (3 to 7%)<sup>2, 8</sup>, gallstones (2%), volvulus (4 to 15%)<sup>15-17</sup> and intussusception (4 to 8%)<sup>9, 10</sup>.

In this sense, intestinal intussusception results from abnormal peristaltic movement, leading to one segment of the intestine telescoping into an adjacent segment<sup>11</sup>. The segment that is moved inward is referred to as the "intussusceptum," while the segment receiving the invagination is called the "intussusciens"<sup>12</sup>. While intussusception in children is often idiopathic, in adults it is typically

associated with a pathological abnormality or obstruction that disrupts normal peristalsis, causing the proximal intestine to advance into the lumen of a fixed distal segment<sup>13</sup>. Notably, up to 57% of cases may be associated with a malignant tumor<sup>12</sup>, underscoring the importance of early diagnosis and intervention.

Intussusception can occur at junctions where freely moving segments meet retroperitoneal or adhesively fixed segments<sup>14</sup>. It is classified into four types based on location: (1) entero-enteric, confined to the small intestine; (2) colo-colic, involving only the large intestine; (3) ileo-colic, where the terminal ileum prolapses into the ascending colon; and (4) ileo-cecal, where the ileocecal valve is the primary site, making it challenging to distinguish from the ileo-colic variant<sup>14</sup>.

Abdominal pain is the most common presenting symptom of intussusception, followed by changes in bowel habits, nausea, vomiting, and gastrointestinal bleeding<sup>15</sup>. If not promptly diagnosed, intussusception can lead to severe complications such as bowel obstruction, strangulation, and ischemia<sup>16</sup>.

In children, intussusception is typically primary and benign, with pneumatic or hydrostatic reduction often being effective in approximately 80% of cases. In adults, however, intussusception



accounts for 5% of all cases and is frequently secondary to an underlying pathological condition that acts as the lead point. Due to the significant risk of associated malignancy, early diagnosis and definitive treatment are crucial, with surgical resection generally being the preferred approach<sup>14</sup>.

In turn, cutaneous melanoma is a malignancy originating from the transformation of melanocytes, melanin-producing cells derived from the neural crest. Although primarily found in the skin, melanocytes are also present in the eyes, ears, gastrointestinal tract, meninges, and mucous membranes, including those of the oral, nasopharyngeal, anorectal, and genital regions<sup>17</sup>. Globally, cutaneous melanoma ranks as the 12th most common cancer, with an age-adjusted incidence rate of 3.0 per 100,000 people.

In this context, the incidence of cutaneous melanoma has notably increased among light-skinned populations, likely due to a combination of environmental, behavioral, and genetic factors<sup>18</sup>. In Brazil, the National Cancer Institute (Instituto Nacional de Câncer - INCA) estimates approximately 4,200 cases annually among men and 4,250 cases among women for the 2020-2022 period. Given ongoing population growth and increasing life expectancy, the number of melanoma cases is expected to rise further in the coming decades<sup>19</sup>.

Malignant melanoma is known for its high metastatic potential and poor prognosis, with a 5-year survival rate ranging from 9% to 13%<sup>20</sup>. This aggressive cancer quickly spreads to multiple organs, and gastrointestinal metastases are found in about 60% of patients with malignant melanoma upon autopsy<sup>21</sup>.

Gastrointestinal metastases are found in approximately 20% of patients with stage IV cutaneous melanoma. However, autopsy studies indicate a much higher prevalence of 58% among deceased individuals. The most commonly affected sites are the small intestine, followed by the large intestine and stomach<sup>22</sup>. Metastatic involvement of the small intestine is observed in 2-5% of patients with malignant cutaneous melanoma.

Therefore, this study presents a case of a 40-year-old patient with metastatic melanoma involving the lungs, spleen, and adrenal glands, who has experienced recurrent episodes of acute obstructive abdomen up to the present. The patient's condition required two separate surgical interventions to address the ongoing abdominal complications.

### Case Presentation:

A 40-year-old female with stage IV metastatic cutaneous melanoma, involving the lungs, spleen, and adrenal glands, presented with a 30-day history of vomiting and loose stools progressively worsening over the past 4 days. On physical examination, she appeared in fair general condition but was notably dehydrated. The abdominal examination revealed a distended, globular abdomen with high-pitched bowel sounds and diffuse mild tenderness, though without signs of peritonitis.

A computed tomography (CT) of the abdomen demonstrated an irregularly thickened ileal loop in the right iliac fossa, exhibiting focal parietal enhancement and luminal narrowing. Additionally, there was significant proximal small bowel distension with both liquid and gas associated with evidence of mesorectal fat stranding with irregular contours extending to the left fascia. In light of the acute obstructive abdomen presentation and the imaging findings, surgical intervention was indicated.

During exploratory laparotomy, the examination of the abdominal cavity revealed notable dilatation of the small bowel and an intussusception approximately 60 cm from the ileocecal valve (Figure 1). Further inspection uncovered sparse intraluminal nodules, whose appearance was similar to that of secondary neoplastic implants. An enterectomy was performed, involving the resection of 10 cm of the jejunum. This was followed by the creation of a manual, isoperistaltic, side-to-side entero-enteric anastomosis.



**Figure 1.** Resection of 10 cm of the jejunum with the metastatic implant and intussusception point.

On the 19th postoperative day, the patient experienced wound dehiscence and evisceration, necessitating a secondary surgical procedure for abdominal wall repair with mesh plication. The

patient was subsequently discharged and scheduled for ongoing follow-up with clinical oncology.

Approximately two months after the initial surgical intervention, the patient returned to the emergency department with diffuse abdominal pain and vomiting that had persisted for three days. A new abdominal CT scan was performed, which revealed ileoileal intussusception localized to the mesogastric region, alongside a 38 ml fluid collection in the same area and a small amount of free fluid. The patient underwent a second exploratory laparotomy and a new intussusception was identified 140 cm distal to the Treitz angle. A 10 cm segment of affected jejunum was resected, and a side-to-side isoperistaltic entero-enteric anastomosis was performed using a linear stapler with supplementary suturing. No additional obstructions or perforations were found.

During an ambulatory appointment, the results of the pathological examination confirmed metastatic melanoma localized to the intestinal segment in both specimens submitted. The patient is currently under follow-up with both general surgery and clinical oncology. She is receiving chemotherapy every four weeks as part of the Relativity - 127 research protocol.

#### **Discussion:**

The small intestine's abundant blood supply plays a significant role in the metastasis of cutaneous melanoma<sup>23</sup>. Primary intestinal melanoma typically presents as a solitary intramural lesion, most often found in the ileum. In contrast, secondary melanoma of the small intestine usually appears as multiple submucosal polypoid lesions affecting both the jejunum and ileum. The preoperative diagnosis of either metastatic melanoma or primary melanoma of the small intestine poses considerable challenges due to its often subtle presentation.

In that context, factors predisposing to intussusception in cases of metastatic melanoma include the abnormal motility of the affected intestinal segment and its increased diameter<sup>24</sup>. These characteristics can lead to the telescoping of one segment of the intestine into another, complicating the clinical picture and necessitating careful surgical intervention and management.

Small bowel melanoma exhibits an aggressive pattern of behavior, and when associated with metastases, its prognosis is considerably worse compared to cutaneous or extra-intestinal melanomas. In this context, the average survival time is approximately 6 months, with a 5-year overall survival rate of less than 10%<sup>24, 25</sup>.

The optimal treatment approach for intestinal intussusception in adults is still a matter of debate<sup>13</sup>. A key area of controversy is whether to perform reduction of the affected bowel segment or to proceed directly to resection<sup>15, 26</sup>. The prevailing literature generally supports resection of the intussuscepted segment, regardless of whether malignancy is confirmed through histopathological analysis<sup>13</sup>. The primary concerns driving this approach include the risk of tumor cell embolization and the potential for bowel perforation. Perforation of an edematous, fragile, or ischemic bowel segment can lead to the spread of tumor cells and microorganisms into the peritoneal cavity<sup>12, 13, 15, 27</sup>. Therefore, the resection is advocated to mitigate these risks and ensure a more controlled management of the condition.

However, this hypothesis is still lacking high-quality evidence, as the majority of current data are from case reports<sup>12, 15</sup>. According to recent literature, in cases of small bowel intussusception where a benign etiology is strongly suspected and there are no indications of ischemia or there are concerns about short bowel syndrome following resection, reduction of the affected segment may be considered<sup>13, 26</sup>. On the other hand, when malignancy is confirmed or suspected, it is crucial to proceed with surgical resection of the affected bowel segment in line with oncological principles. This approach should include lymphadenectomy of the primary drainage vessels to ensure the right staging and effective treatment<sup>12, 27</sup>.

Regarding surgical management, both laparotomy and laparoscopy are viable options, the choice is based on the surgeon's expertise and the specific clinical scenario<sup>27</sup>. The laparoscopic approach may serve for both diagnostic and therapeutic purposes<sup>15</sup>. Post-resection, potential surgical options include primary entero-enteric anastomosis, right colonic anastomosis, or ileocolic anastomosis, depending on the extent and location of the resection.

In the present case, the decision to perform an open surgical resection was driven by the acute obstructive abdomen, signs of intestinal ischemia, and the presence of multiple adjacent metastatic implants. Unfortunately, due to the inherently aggressive and disseminative nature of melanoma, the patient experienced a recurrence of symptoms two months following the initial surgical intervention.

#### **Conclusion:**

Malignant melanoma is renowned for its high metastatic potential and poor prognosis, with a 5-year survival rate ranging from 9% to 13%<sup>20</sup>. This

aggressive cancer exhibits a rapid dissemination pattern, affecting multiple organs and leading to gastrointestinal metastases in approximately 60% of patients upon autopsy<sup>21</sup>. The small intestine is the most frequently involved site, followed by the large intestine and stomach<sup>22</sup>. Metastases to the small intestine occur in 2% to 5% of patients with cutaneous malignant melanoma.

Metastatic implants within the small intestine can serve as lead points for intussusception, a significant risk factor for acute bowel obstruction and potentially life-threatening abdominal emergencies such as obstructions, necessitating prompt and decisive surgical intervention. Given the considerable risk of tumor cell embolization and the potential for perforation of an edematous, friable, or ischemic bowel segment, leading to the contamination of the peritoneal cavity with tumor cells and microorganisms, the resection of the affected segment is generally advised. This strategy not only addresses the immediate mechanical obstruction but also mitigates the risks associated with malignant melanoma progression, ensuring comprehensive management of both the malignancy and its complications.

In the presented case, the patient exhibited signs and symptoms of acute obstructive abdomen, associated with ischemia of the intussuscepted segment and intraoperative evidence of multiple adjacent metastatic implants, which required surgical resection of the affected segment along with primary enteroanastomosis. Despite these interventions, the patient experienced a recurrence of intussusception due to the invasive and disseminative nature of melanoma.

Given the high likelihood of recurrence and the potential for functional impairment from multiple intestinal resections, future management should involve a multidisciplinary approach that integrates surgical intervention with oncological care. This approach should aim not only to address immediate surgical needs but also to consider long-term strategies to prevent recurrence and preserve intestinal function. Enhanced preoperative evaluation, surgical techniques, and ongoing oncological treatment are essential to optimize patient outcomes in the face of such a challenging diagnosis.

#### Additional Information:

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**Ethical conduct of research:** The authors state that they have obtained appropriate institutional review board approval or have followed the principles outlined in the Declaration of Helsinki for all human investigations. The authors state that they have obtained verbal and written informed consent from the patient/patients prior to surgery and for the inclusion of their medical and treatment history within this case report.

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