

A Successful Ligation of Superior Mesenteric Axis During Radical Resection of Locally Advanced Adenocarcinoma of the Colon

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Abstract

Introduction

The Ligation of the superior mesenteric axis is prohibited during colon cancer surgery or not. But in certain circumstances, this gesture is mandatory and possible under certain conditions in order to obtain radical type R0 surgery for locally advanced colon adenocarcinoma. We report an exceptional observation of a 44-year-old male with a 16cm large diameter tumor of the transverse adenocarcinoma infiltrating the gastric antrum, the mesentery, the greater omentum and the superior mesenteric axis. The intervention consisted of a right hemicolectomy enlarged to the transverse, the gastric antrum, the greater omentum and the superior mesenteric axis. The latter was ligated and sectioned downstream from the start of the 3rd jejunal pedicle. Digestive continuity was restored using an end-to-side gastroduodenal anastomosis and an end-to-side ileocolic anastomosis. Early post operative intraperitoneal chemotherapy was instituted over 5 days. The patient had simple consequences and was discharged on the 10th post operative day. The histological study was in favor of a poorly differentiated adenocarcinoma, with vascular emboli and 2 infiltrated lymph nodes out of 84 removed. This patient received 6 courses of systemic chemotherapy based on well-tolerated XELOX. He is alive without recurrence at 11 years and 10 months with a correct transit and without short small intestine syndrome.

Conclusion

This exceptional observation shows the possibility of ligation of the superior mesenteric axis when it is infiltrated by colon adenocarcinoma provided that 2 to 3 first jejunal pedicles are left unscathed.

Keywords

Colonic adenocarcinoma; Ligation of superior mesenteric axis; Radical surgery; Advanced colonic cancer

Introduction

Radical surgery for adenocarcinoma of the colon obeys strict criteria represented by colonic resection in tissue free of cancerous tissue and the most complete eradication possible of the lympho-nodal structures draining the tumor concerned. Tumor eradication so requires extending the procedure to regions or organs infiltrated by adenocarcinoma [Lienert]. Through this observation, we report the exceptional case of an enlargement of a right hemicolectomy for an adenocarcinoma of the colon transverse to the gastric antrum, the small intestine after ligation of the superior mesenteric pedicle.

Observation

A 44-year-old man was admitted to our department surgery with a diagnosis of colonic cancer. He had history of pulmonary tuberculosis treated and cured for more than 20 years ago. The clinical symptom started in an insidious way 4 months ago with the installation of diffuse abdominal pain, progressive weight loss, asthenia and episodes of melena.

On physical examination

The patient's weight was 57kg for a height of 1m70 and a BMI of 19.7. Abdominal palpation: we noted the existence of a mass of around 10cm in large diameter of malignant appearance, sitting at the level of the epigastrium and the supra-umbilical region.

A total colon copy revealed the presence of an ulcero-budding and stenosing process, located at the level of the transverse colon. The histological study of the biopsy carried out was in favor of a poorly differentiated adenocarcinoma. Abdominal ultrasound, showed the appearance of gastric distension. The rest of the ultrasound exploration was normal. The carcinoembryonic antigen (CEA) and the Ca19.9 were respectively more than 200ng/ml (high) and at 9.5IU/ml (normal). Anemia was noted at 6g/100ml. The rest of the pre-operative assessment was within normal limits (Figure 1).

After a transfusion of 2 red blood cells, the patient was scheduled for a possible curative surgery. We performed the procedure through a midline incision above and below the umbilical. Exploration started after peritoneal lavage with 500cc of saline and collection of 10cc for a cytological study at the start of the intervention.

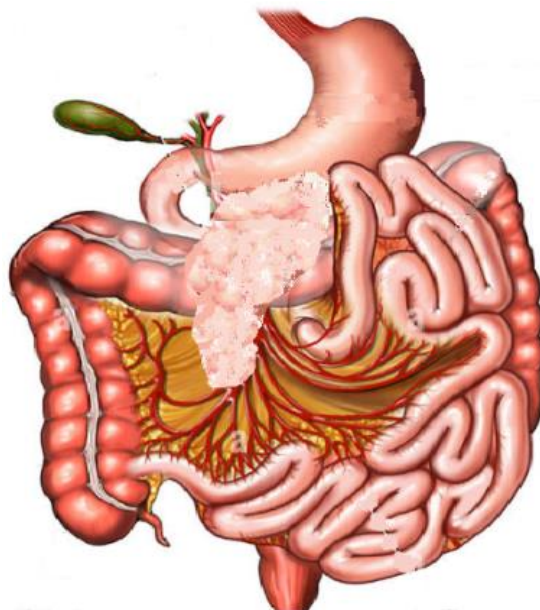


Figure 1: Infiltrative tumeur of colonic cancer.

This exploration highlighted the presence of a tumoral process with an irregular surface, originating at the level of the transverse colon in its median part. This tumor was 16cm in diameter and invaded the gastric antrum, the mesentery in the middle, the greater omentum. There were no peritoneal carcinomatosis or hepatic metastases but a small nodule of 4 mm at the level of the lower surface of segment III which was not suspicious. The duodeno pancreatic block was completely masked as well as the upper part of the mesentery. We completed the peritoneal exploratory with complete Cattell maneuver which showed the absence of invasion of the duodeno pancreatic block but an infiltration of the superior mesenteric axis. The first jejuna loops were free as well as the inferior mesenteric vein. The mesentery next to the mesenteric axis was invaded from the 3rd duodenum to about 3cm from the small intestine. Dissection of the superior mesenteric vascular axis was carried out with release of the duodeno jejunal angle and the inferior mesenteric vein from the left. A colon epiploic detachment was produced by the left side and the left pancreas released as well as the left colon up to the left angle. At this time of this exploration, we highlighted the infiltration of the superior mesenteric axis (artery and vein) and the integrity of the 3 proximal jejuna pedicles and downstream their 1st, 2nd and 3rd order arches. The results of this dissection led us to retain the option of a right colonic resection extended transversely, to the gastric antrum, the greater omentum, the mesentery with ligation of the superior mesenteric pedicle just after the departure of the 3rd jejuna pedicle. Before hand, we performed a clamping of the superior mesenteric pedicle which showed that around 1m50 of small intestine remained vascularized. On these observations, we began the resection. The latter was carried out after ligatures-sections of the artery then of the superior mesenteric vein, followed by ligatures-sections of the Riolon arch 10cm from the left colic angle, the pedicles of the last ileal loop and the blood vessels of the gastric antrum. The 1st, 2nd and 3rd order arches of the remaining small intestine were respected. We performed the ileal, leftcolic, duodenal and antral section. After removal of the surgical specimen, we began with an end-to-end gastro duodenal anastomosis according to the Pean mode with 2 half-subjects using 3/0 absorbable suture, followed by the closing of

the colonic end with an over lock with 3/0 absorbable thread. After that, we performed end-to-side jejunocolic anastomosis using 2 hemisur jets with 3/0 absorbable suture. The closure of the mesenteric breach with separate switches of 3/0 absorbable was done at the end. Peritoneal washing with warm saline solution was done then. We finished the intervention by plane-by-plane parietal closure and filling of the peritoneal cavity with 2.5 liters of SSI associated with 100mg of Cisplatin for early post operative intra peritoneal chemotherapy (EPIC). Intraoperative bleeding during the intervention was estimated at 300cc. The patient received red blood cells and the procedure took place without any incident or accident. Immediate postoperative chemotherapy took place over the planned 5 days without incident with the addition of 5 fluorouracil on the 2nd, 3rd, 4th and 5th days at 500mg/m²/day. We took 2 samples of peritoneal fluid postoperatively on D3 and D5 with cytological study and the analysis came back in favor of its benignity. The postoperative course was simple and the patient left the service on the 10th post operative day. The histological results of the operation were in favor of a poorly differentiated adenocarcinoma, invading the gastric antrum to the muscularis, the greater omentum, the mesentery, the mesenteric axis as well as the mesenteric fat. Dissection of the distal, proximal, pre-pancreatic, superior mesenteric, right mesocolon, right gastro-epiploic, transverse mesocolon and greater omentum removed 84 lymphnodes with infiltration of 2 of them (mesocolic lymphnode and a ganglion of the greater omentum). These results classified the patient as T4N1M0, without perineural encasements and with vascular emboli. The peritoneal cytology at the beginning and at the end of the intervention and those performed post operatively were benign. After one month, the ACE returned to a normal level and the patient benefited from 8 courses of chemotherapy based on XELOX. The patient is alive without recurrence and with normal clinical condition 12 years and 10 months after the intervention. He presents a transit made of 2 to 3 stools per day and has a weight of 55kg. He does not have short bowel syndrome nowday (Figure 2,3).

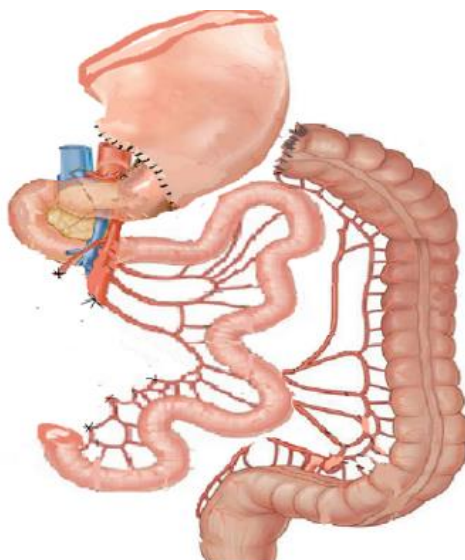


Figure 2: View after résection and gastroduodenal anastomosis.



Figure 3: View after jejunocolic anastomosis.

Comments

Our observation shows the possibility of extending curative resection of an adenocarcinoma to other organs and anatomical regions and specially the ligation of superior mesenteric axis. To our knowledge, ligation of this axis during cancer surgery for colon adenocarcinoma has not been reported to date. The superior mesenteric axis is one of the latter and constitutes an obstacle to oncological resection. It is known that this vascular axis must be preserved because it irrigates the small intestine and right colon. Its ligation-section is very unusual. But vascular anastomoses and especially 1st, 2nd and 3rd order arches make it possible to overcome this difficulty provided that at least the first 2 to 3 jejunal pedicles are preserved after ligation-section of the superior mesenteric axis. We had the same reasoning developed recently by Deguelte [2] who classifies lympho-ganglionic system infiltration in neuro-endocrine tumors of the small intestine into 4 stages. According to this classification, our patient responds to stage III high during which the first 3 to 4 jejunal pedicles are still preserved while the mesenteric axis is infiltrated. The respect of these first 3 pedicles allows a vascularization of more than 1meter of small intestine long and avoids the syndrome of the short intestine. The richness of the vascular anastomoses in the digestive tract and in particular the mesentery allows the sacrifice for oncological purposes of the superior mesenteric axis (Figure 4).

In our patient, the diagnosis of invasion of the superior mesenteric axis was made intra operatively but currently modern examinations such as injected computed tomography allow the study in 3D of the digestive vascular axes and highlight the infiltration or the integrity of the proximal pedicles of the jejuna loops [3]. We insist on the fact of properly exploring the intestinal vascularization when a clinician palpates a tumor mass of colonic origin preoperatively. We finished the intervention by adding intraperitoneal chemotherapy in order to consolidate the action of the surgery. This loco regional therapy, which aims to prevent peritoneal recurrence. This therapeutic has also given us satisfaction in patients with a locally advanced tumor, as for this patient [4]. We also control the peritoneal cytology in the presence of any adenocarcinoma of the colon with serous involvement and more in order to have an idea of a possible dissemination of malignant cells in the peritoneal cavity [5].

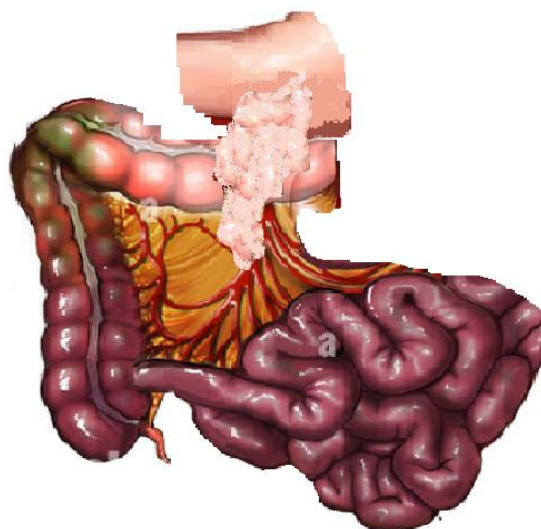


Figure 4 :Schematic view of resected specimen.

Systemic adjuvant chemotherapy was instituted at the end of the first post operative month for this patient, in order to consolidate the action oncological surgery [6]. The patient has regained had preoperative weight and does not have short bowel syndrome nowday (Figure 5).



Figure 5 : Resected specimen. Colonic, gastric and small intestinal.

Conclusion

To our knowledge, this is the first observation of a ligature-section of the superior mesenteric axis during radical colon cancer surgery for adenocarcinoma. This observation illustrates the possibility of ligation of the superior mesenteric pedicle during extended cancer surgery for colonic adenocarcinoma associated with loco regional therapy based on intra peritoneal chemotherapy. We insist on fine preoperative exploration by injected computed tomography with fine study of the superior mesenteric axis and its branches, in particular those of the first jejuna pedicles. This technical device deserves to be known and used whenever possible. It allows carcinological surgery with long-term survival.

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