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Unexpected duodenopancreatectomy in an "awake" gastrectomized patient: Case report and technical notes

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ABSTRACT

INTRODUCTION AND IMPORTANCE: Early diagnosis, surgical techniques and adjuvant therapy in patients undergoing gastrectomy for cancer have prompted an increase in the number of long-term surviving patients. The detection of pancreatic head tumours in patients undergoing gastrectomy is challenging, even for expert surgeons.

CASE PRESENTATION: A 78-year-old woman presented with a previous history of gastric cancer treated 2 years before D2 total gastrectomy and Roux-an-Y reconstruction. The patient reported uneven tissue located on the head of the pancreas 6 months after the operation. MRI showed dilation of the intrahepatic bile ducts and common bile duct stones. During the preoperative evaluation, neuraxial-type anaesthesia was proposed to the patient given her frailty. After choledochotomy, solid tissue involving the ampulla of Vater was found. Although not originally planned, a duodenopancreatectomy (DP) was performed under neuraxial anaesthesia.

CLINICAL DISCUSSION: The approach to DP in patients with a history of gastrectomy and Roux-en-Y reconstruction requires a modified surgical approach, which is not standardized. Other cases of DP performed on patients under neuraxial anaesthesia are not described in the literature. Performing a modified reconstruction, we can reduce the number of intestinal anastomoses and the risk of anastomotic dehiscence. The choice of neuraxial anaesthesia has been demonstrated to be a suitable solution for the patient with rapid recovery.

CONCLUSION: In our experience, DP is a safe and feasible procedure in gastrectomized patients.

Mechanical hepaticojejunal (HJ) anastomosis is a possible alternative to traditional manual anastomosis. Neuraxial anaesthesia in selected patients can be considered a safe practice for rapid postoperative recovery compared to general anaesthesia.

1. Introduction

Improvements in early diagnosis, surgical techniques and adjuvant therapy in patients undergoing gastrectomy for cancer have promoted an increase in long-term survival [1,15]. The detection of pancreatic head or papilla tumours in patients undergoing gastrectomy is challenging, even for expert surgeons. The literature describing the potential reconstructions to be performed in cases of duodenopancreatectomy in patients who have already undergone operation for gastric cancer is limited. The management of these patients is crucial, especially fragile and elderly patients whose anatomy and digestive physiology have already been altered by the first operation.

Neuraxial anaesthesia techniques have been recently introduced in major surgery for elderly patients. It is estimated that the number of octogenarians in industrialized countries will quadruple by 2050 [2,14], and more often, this type of patient (occasionally very fragile and with a history of cancer) undergoes major abdominal surgery [3].

In this context, spinal and epidural anaesthesia (the 2 main types of neuraxial blockade) have been shown to reduce postoperative morbidity in terms of minor neuroendocrine stress response with improved pain control. The reduction of cardiac and respiratory complications [4], incidence of thromboembolic events [5] and an earlier return of gastrointestinal function with early patient mobilization [6] have been reported after this type of anaesthesia.

We report a case of a gastrectomized patient who came to our attention for obstructive jaundice due to gallstones of the biliary tract. A laparotomy under neuraxial anaesthesia was performed. The surgical plan to perform a choledochotomy and cleaning of

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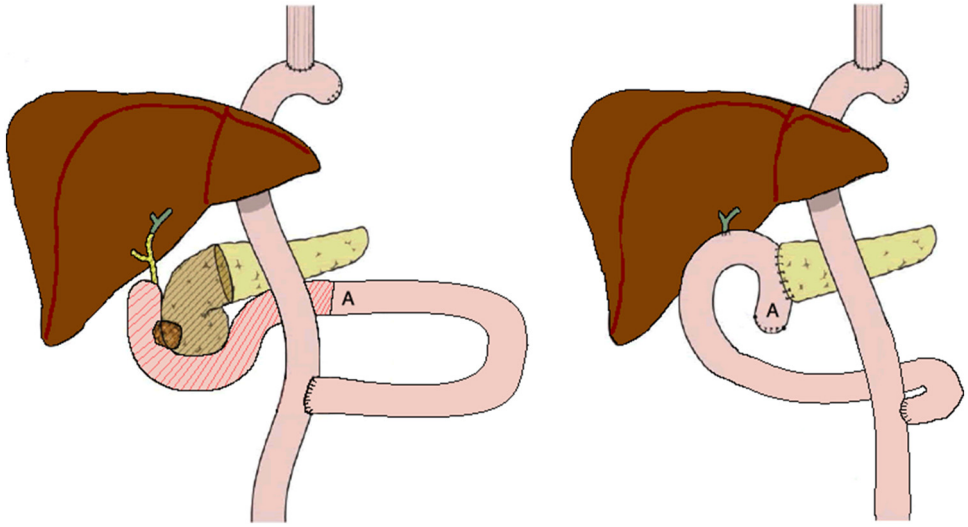

Fig. 1. Performed reconstruction after duodenopancreatectomy.

the biliary tract was changed due to the incidental diagnosis of an ampullary neoplasm.

This case report has been reported in line with the SCARE criteria [7].

2. Case report and surgical technique

A 78-year-old woman in fair general clinical conditions presented with a previous history of gastric cancer treated 2 years previously with D2 total gastrectomy and Roux-an-Y reconstruction. Pathological analysis revealed moderately differentiated (G2) adenocarcinoma (pT3N0). The patient did not undergo subsequent adjuvant chemotherapy. Her medical history included laparoscopic cholecystectomy for gallbladder stones, arterial hypertension treated with angiotensin receptor blockers, and colic diverticulosis under treatment with rifaximin and mesalazine. The patient did not report any other chronic conditions or allergies and had no inheritable pathologies. The patient reported that during the regular oncological follow-up, 6 months after the operation, uneven tissue was found on the CT scan located on the head of the pancreas. Therefore, she underwent MRI, which revealed a slight dilation of the intrahepatic bile ducts and common bile duct (CBD) stone (negative head of the pancreas). The diagnosis of CBD lithiasis was confirmed after subsequent CT and MRI assessments. Due to the onset of fever and jaundice associated with inappetence and asthenia with weight loss, the patient was hospitalized and subsequently moved to our unit (General Surgery Unit – tertiary level hospital). Blood tests showed hyperbilirubinemia (15 mg/dL, direct Bil.: 12.81 mg/dL) and tumour markers in the normal range (CEA: 2.1 ng/mL, AFP: 16 ng/mL, CA19.9: 32 U/mL). Given that an endoscopic approach was not possible due to the previous total gastrectomy with Roux-en-Y reconstruction, we planned elective surgery to perform a choledochotomy and cleaning of the biliary tract.

During the preoperative anaesthetic evaluation, neuraxial-type anaesthesia was proposed to the patient given her frailty (ASA III) and the potential for faster functional recovery after surgery.

The patient underwent antibiotic prophylaxis and venous thromboembolism prophylaxis with low molecular weight heparin. The surgery was performed by the chief of surgery. After median relaparotomy and adhesiolysis, exploration of the abdomen revealed significant dilation of the CBD and a voluminous lymphadenopathy (station 12p) of approximately 3 cm that was removed. After choledochotomy, the exploration of the CBD revealed solid tissue corresponding to the ampulla of Vater. A duodenotomy was performed, revealing the presence of neoplastic tissue. Despite not being planned and given the patient's general clinical conditions, the limited time allowed by the type of anaesthesia, and the absence of repetitive lesions, a duodenopancreatectomy (DP) was performed.

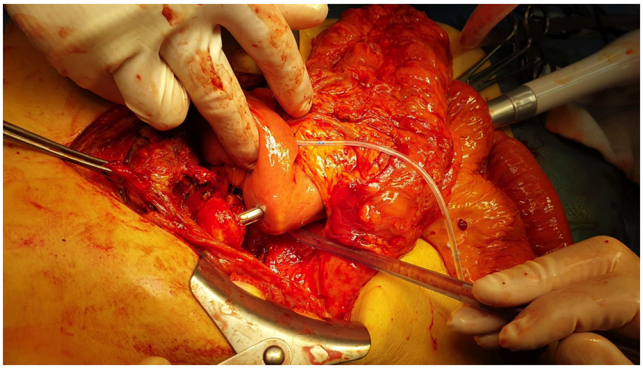

Fig. 2. Mechanical Hepatico-jejunal (HJ) anastomosis.

We proposed a new surgical technique (Fig. 1). After exeresis of the duodenopancreatic block (sparing the previous entero-entero anastomosis), we used the Roux loop, which had a length of approximately 60 cm, to create a pancreatojejunal anastomosis (modified Blumgart anastomosis). The pancreatic duct was relieved by transjejunal externalized drainage, and mechanical hepaticojejunal (HJ) anastomosis was performed using a 21 mm curved intraluminal stapler (Fig. 2). The stapler was inserted by the same Roux loop used for pancreatic anastomosis (letter Äïn Fig. 1). The choice of the unconventional use of a mechanical stapler for hepaticojejunal anastomosis was due to the considerable dilation of the CBD (approximately 25 mm) and the limited time available based on the type of anaesthesia. Subhepatic and perianastomotic (pancreatojejunal) drains were placed. The surgical time was 165 min. The patient was mobilized on the 1 st postoperative day (POD). An amylase/lipase activity assay was performed on PODs I, III and VI. The postoperative hospital stay was characterized by asthenia, a superficial wound infection treated with antibiotic therapy (Clavien-Dindo I), and grade A pancreatic fistula (POPF). The drains were removed on the 7th POD, and the patient was moved to the medicine department for rehabilitation (discharge on the 31 st POD). Outpatient follow-up revealed physical recovery of the patient with a resumption of appetite and weight gain. Patho-

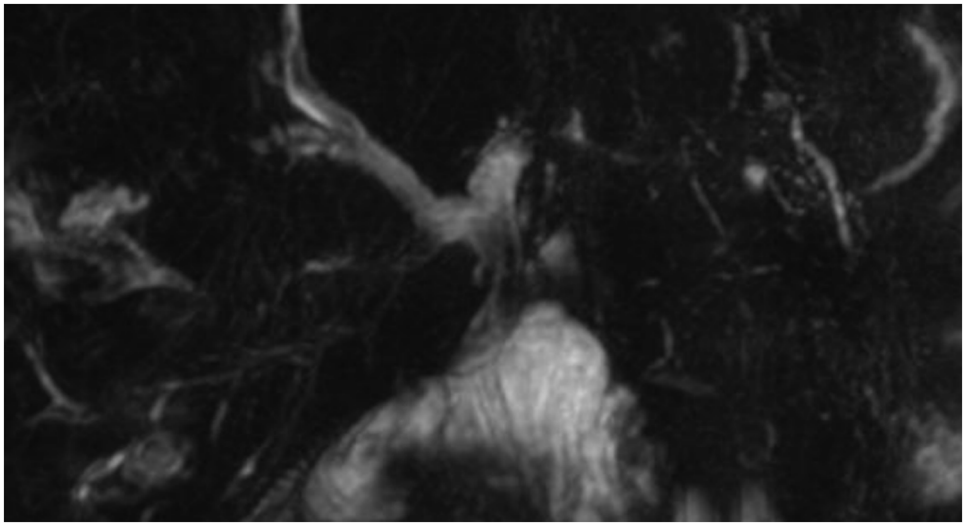

Fig. 3. MRI performed 5 months after the operation.

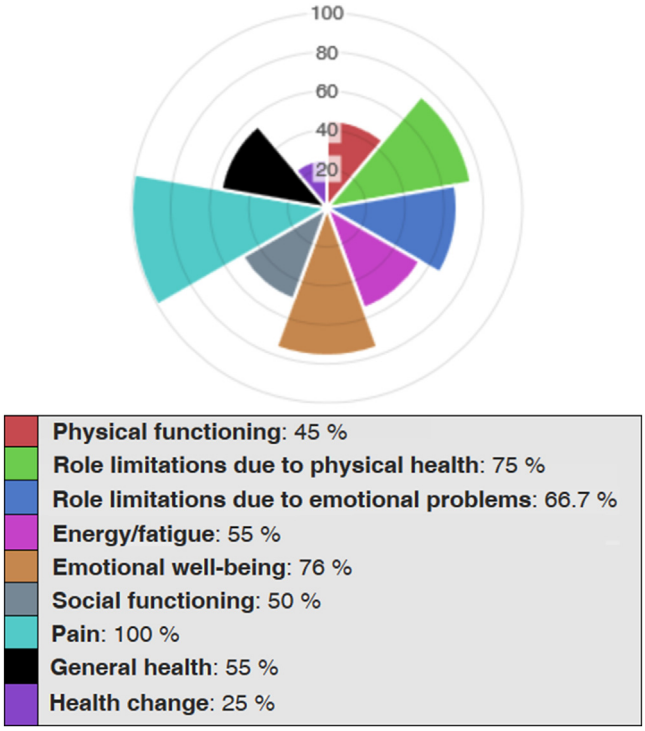

Fig. 4. SF36 questionnaire administered at 6 months follow-up (results).

logical analysis found poorly differentiated (G3) adenocarcinoma of the papilla with squamous and anaplastic features and massive metastasis to the lymph nodes of the hepatic hilum (pT1bN1). Liver metastases were detected three months after surgery, and the patient started adjuvant CHT. HJ anastomosis showed no stricture during the MRI performed 5 months after the operation (Fig. 3). The SF36 [8] questionnaire was administered at the 6-month follow-up (Fig. 4).

3. Anaesthesiologic technique

Female, 78 years old, 45 kg, 165 cm, BMI 16,5 kg/m^2, ASA III, frailty scale 4, candidate for choledochotomy for stones in the CBD. The patient was in poor general condition due to severe chronic malnutrition after total gastrectomy. Surgical time estimated 90 min.

Given the general status of the patient, we planned spinal anaesthesia (single shot). After a preload of 500 ml of crystalloid solution, we prepared a sterile field near the thoracic and lumbar regions. We reached the subarachnoid space between the 8th and 9th thoracic intervertebral spaces using a Whitacre 25 G needle. Doses of 17 mg of ropivacaine, 2 mg of midazolam, 10 mcg of dexmedetomidine and 20 mg of ketamine were injected (a total volume of 5 ml was used, in NaCl 0.9% solution - midazolam, dexmedetomidine and ketamine were additive free). Soon thereafter, a bilateral erector spinae plane block (ESPB) injecting ropivacaine 0.25% (20 ml on each side) was performed to control postoperative pain. This procedure was performed with the patient in the lateral position. Sedation was achieved with intravenous dexmedetomidine (0.7–1 mcg/kg/h) with a target Richmond Agitation-Sedation Scale (RASS)-1/-2.

Surgery began after achieving a Bromage scale of 2 and the targeted RASS. The patient was on spontaneous breathing in a Venturi mask with FiO_2 at 40%, which was maintained during the whole procedure with a constant SpO_2 of 95–99%. Sensory and motor blocks were achieved between T2 and L2 and tested with pinprick.

Three episodes of hypotension occurred after the spinal (at 10, 25, 30 min) and were managed with a bolus of 5 mg of ephedrine to maintain a mean arterial pressure (MAP) greater than 65 mmHg. No further need of vasopressor was noted. Given the length of the surgery, at 120 min, we administered 100 mcg fentanyl (two boluses of 50 mcg) to maintain the anaesthesia level. No complications were recorded intraoperatively or in the postoperative period.

4. Discussion

Previous gastrectomy is recognized as a risk factor for the development of pancreatic cancer. However, in the literature, reconstruction type BII is considered more risky than Roux [9]. Here, considering our case (Vaterian ampulloma), we can assume that the metabolic alterations due to the previous operation play a role in the carcinogenesis and development of this type of tumour. The approach to PD in patients with a history of gastrectomy and

Roux-en-Y reconstruction requires a modified surgical approach that is not standardized.

In fact, the adhesions, the variability of the anatomical structures, the atypical vascular models and the length of the residual intestine are unpredictable variables for reoperation [10].

In the literature, reconstruction after DP in gastrectomized patients often involves the demolition of the previous entero-enteric anastomosis [10–12,16]. Using the remaining part of the afferent loop for the PJ and HJ, we can reduce the number of intestinal anastomoses and the risk of anastomotic dehiscence. Furthermore, the reconstruction proposed allows us to avoid a common complication, namely afferent loop syndrome.

Although the literature has reported a considerable rate of biliary leakage and/or stricture after mechanical HJ anastomosis [13], we used a mechanical circular stapler considering the large lumen (more than 2 cm) of the CBD and the need to speed up the procedure. However, a prospective randomized study or multicentre data collection on the use of the stapler for this type of anastomosis would be required due to the limited data available in the literature.

Even if not originally considered in the preoperative plans, the choice of neuraxial anaesthesia has been demonstrated to be a suitable solution for the patient with rapid recovery. Other cases of DP performed on patients under neuraxial anaesthesia are not described in the literature. In fact, the use of this type of anaesthesia for major surgery is still administered on an experimental basis and only in a few centres. The great potential of this technique, which allows a rapid recovery of fragile patients, should also be assessed for complex surgery interventions in third-level centres.

5. Conclusions

In our experience, duodenopancreatectomy is a safe and feasible procedure in gastrectomized patients.

Mechanical anastomosis represents a possible alternative to traditional manual anastomosis.

Neuraxial anaesthesia in selected patients can be considered a safe practice for rapid postoperative recovery compared to general anaesthesia.

A close collaboration between the surgical and anaesthetic team, both perioperatively and intraoperatively, greatly improves performance with a clear benefit for the patient. In our patient, after surgery, we observed good functional recovery at 6 months with the disappearance of the jaundice and the resumption of appetite with weight gain, significantly improving her quality of life.

Declaration of Competing Interest

No conflicts of interest to declare.

Sources of funding

No funding received.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Papagni Vincenzo: conception of study design, data collection, analysis, manuscript writing, revision and manuscript submission.

Piacente Claudia: anaesthetist, conception of study design, data collection, analysis, manuscript writing and revision.

Varvara Miriam: anaesthetist, conception of study design, data collection, analysis, manuscript writing and revision.

Vincenti Leonardo: first surgeon, conception of study design, data collection, analysis, manuscript writing, revision.

Registration of research studies

Not applicable.

Guarantor

Leonardo Vincenti.

Provenance and Peer Review

Not commissioned, externally peer-reviewed.

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