

CASE REPORT

A novel safe approach to laparoscopic colorectal cancer resection in patients with ventriculoperitoneal shunt: report of two cases and literature review

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Abstract

There is ongoing challenges regarding the safety of performing laparoscopic surgery with the presence of ventriculoperitoneal (VP) shunts, especially in patients treated for cancer disease. To date, only one case has been reported in the English literature. Herein, we report an additional two cases of patients with previous insertion of a VP shunt, diagnosed with colon cancer. Both our patients underwent successful laparoscopic colectomies, without clamping or removal of the VP shunt, with no reported perioperative complications or postoperative neurological deficits. Laparoscopic bowel resection for cancer, in patients with a pre-existing VP shunt, could be considered a potentially safe and feasible procedure. Furthermore, due to the increasing number of patients with VP shunts, additional case reports and investigations are warranted to further confirm safety of this procedure.

INTRODUCTION

Ventriculoperitoneal (VP) shunts are silicone catheters placed from the lateral brain ventricle through a subcutaneous tunnel into the peritoneal cavity, in order to drain excess cerebrospinal fluids. Since laparoscopic surgery has become the standard approach in many abdominal operations, several cases have high lightened the potential hazards of this technique, in patients with VP shunts. The primary concerns in laparoscopic surgery in patients with VP shunt are a clinically significant increase in intracranial pressure (ICP) and retrograde shunt failure. Nonetheless, an increase in ICP has never shown to be clinically significant, moreover, ICP monitoring likely outweighs the risk of adverse events [1]. Other concerns include the development of severe thoracic subcutaneous emphysema with compromised ventilation leading to increase in ICP. There is ongoing controversy regarding the safety of performing laparoscopic surgery with the presence of

VP shunts, especially in patients treated for cancer disease. To our knowledge only one previous case was reported [2].

We herein present two cases of adult colon cancer patients with VP shunts that underwent laparoscopic surgery.

CASE PRESENTATION

Case 1

A 71-year-old man was referred to our colon and rectum clinic, following diagnosis with right hepatic flexure colon cancer, which was detected by colonoscopy, due to abdominal pain and recent change in bowel habits. Medical history included diagnosis with hydrocephalus 18 years earlier. He received a VP shunt that was routed subcutaneously, through the right thoracic region into the abdominal cavity, at the epigastric region.

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The current procedure, laparoscopic right hemicolectomy was performed using standard 4 port technique. No clamping of the catheter was done. The postoperative course was uneventful with no neurological deficit. The patient was discharged 6 days postoperatively.

Case 2

A 78-year-old woman was referred to our colon and rectum clinic following diagnosis of left colon cancer, which was detected by colonoscopy, due to rectal bleeding. Medical history included four previous abdominal operations: appendectomy, open cholecystectomy and two caesarian sections, and an insertion of VP shunt through left thoracic region into the abdominal cavity.

The current procedure, her fifth abdominal surgery, laparoscopic left hemicolectomy was performed using standard 4 port technique. Unusual dense adhesions were found. No clamping of the catheter was done. The postoperative course demonstrated a slow recovery with mild wound infection treated with drainage and orally antibiotics only. No neurological deficit was detected. The patient was discharged 11 days postoperatively.

DISCUSSION

To our knowledge, there is only one previously published case report in the English literature of a cecal cancer patient with previous history of a VP shunt that was treated by laparoscopic right colon resection [2].

Herein we report an additional two cases of patients with previous insertion of a VP shunt, diagnosed with colon cancer. Both our patients underwent successful laparoscopic hemicolectomies, without clamping or removal of the VP shunt, with no reported perioperative complications or postoperative neurological deficits. Our decision to leave the VP shunt in place was in contrast to the aforementioned case report, which involved manipulating and clamping of the shunt prior to insufflation of carbon dioxide, to prevent adverse effects from the pneumoperitoneum.

Barina et al. was the first to report on the clinical course, in adults with VP shunts in place, during open appendectomy for appendicitis. Similar to our report, they also demonstrated, in general, no shunt-related complications, such as malfunction or infection [3]. Wadhwa et al. [4] were the first to report a retrospective review of curative-intent open surgery for gastrointestinal cancers in adult patients with VP shunts. In this study the authors demonstrated that the presence of VP shunt did not increase the risk of postoperative complications, such as increased ICP, pneumocephalus and infectious meningitis. They did recommend intraoperative isolation of the shunt away from the operative field to prevent contamination.

Kerwat et al. [5] showed that performing laparoscopic cholecystectomy, with no externalization of the shunt catheter, to be a safe procedure. Furthermore, Jakman et al. [1] found no clinically significant increase in ICP, in patients with VP shunts, with insufflations pressure of 16 mmHg and average of 3 h operative time. Moreover, other studies demonstrated no increase in air embolism, shunt infectious and retrograde failure of the valve system [6], although conversion to open surgery was reported to be higher with the presence of a VP shunt, mostly due to dense adhesions [7].

Nonetheless there is controversy regarding safety of performing laparoscopic surgery with the presence of VP shunts, especially in patients treated for cancer disease. Thus, some

important issues should be taken under careful consideration, such as the influence of a pneumoperitoneum on iatrogenic spread of cancer cells, port-site metastasis, which seem to be characteristic to laparoscopic surgery. Furthermore, pneumoperitoneum by CO₂ insufflation might encourage VP shunt-related subcutaneous seeding of cancer cells. Otani et al. reported a rare case of pancreatic cancer diagnosed by the detection of skin metastases along the VP shunt catheter, as an unfortunate consequence of its presence [8]. Magtibay et al. [9] also reported a very rare case, in which the VP shunt served as a conduit for the spread of malignant medulloblastoma cells to the peritoneum. Nonetheless, the reported incidence of port-site metastasis following laparoscopic colon cancer surgery is low. Moreover, when port-site metastasis develops, it tends to occur in patients with advanced disease, such as large and locally advanced tumors or Dukes' C cancers [10]. Therefore, laparoscopic surgery for clinical stage T4 tumors with serosal involvement, as Dukes' C cancers should be used with caution, especially in patients with a VP shunt, as it might encourage VP shunt-related skin metastases.

CONCLUSIONS

Laparoscopic bowel resection for cancer, in patients with a pre-existing VP shunt, could be considered a potentially safe and feasible procedure. Furthermore, due to the increasing number of patients with VP shunts, additional reports and investigations are warranted to further confirm safety of this procedure.

CONFLICT OF INTEREST STATEMENT

None declared.

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