The Cattell-Braasch maneuver might be a good option for a huge abdominal aortic aneurysm

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ABSTRACT

Endovascular repair is often difficult in the case of a huge abdominal aortic aneurysm for anatomic reasons. Here, we describe open repair of a huge infrarenal abdominal aortic aneurysm. Open repair was performed through laparotomy with the Cattell-Braasch maneuver, a technique for right-sided medial visceral rotation. Laparotomy with the Cattell-Braasch maneuver is simple and effective in open repair of a huge abdominal aortic aneurysm extending into the right common iliac artery, for which proximal clamping is difficult because of a tortuous proximal neck just below the hepatic region. (J Vasc Surg Cases and Innovative Techniques 2019;5:35-7.)

Keywords: Laparotomy; Cattell-Braasch maneuver; Abdominal aortic aneurysm

Although endovascular repair is less invasive than open repair, not all patients have an aortic anatomy that permits stent graft implantation.[1] Herein, we describe the case of a huge infrarenal abdominal aortic aneurysm (AAA) treated with open repair as endovascular repair was not appropriate. We approached this huge AAA through laparotomy with the Cattell-Braasch maneuver, a technique for right-sided medial visceral rotation, which could allow good access to the inferior vena cava, abdominal aorta, and common and external iliac vessels with minimal blood loss.[2,3]

Written informed consent was obtained from the patient for the publication of this case report and accompanying images.

CASE REPORT

An 88-year-old woman visited her local hospital with the main complaints of abdominal distention and dizziness. She had no history of laparotomy, and she was taking medication for reflux esophagitis. She was 153 cm in height and weighed 41 kg. A blood test revealed a hemoglobin level of 6.7 g/dL. Computed tomography (CT) showed a huge AAA, and she was transported to our hospital. Contrast-enhanced CT revealed a 78-mm AAA inferior to the renal artery and a 55-mm aneurysm in the right common iliac artery. Expansion of the aortic aneurysm caused the proximal infrarenal aortic neck to extend cranially and to reach the hepatic portal region, and the neck was bent into a reverse S shape (Fig 1). The duodenum, pancreas, and transverse mesocolon were present directly at the anterior wall of the aneurysm. The left common iliac artery showed severe arteriosclerotic changes. Considering that the short and angled proximal infrarenal aortic neck would make endovascular repair difficult, we decided to perform graft replacement of the aneurysm.

Under general anesthesia, a midline abdominal incision from the xiphoid to the symphysis pubis was made with the patient in the supine position. Extended Kocher mobilization was performed, and a peritoneal incision was made from the hepatocolic ligament to the lateral side of the ascending colon. The retroperitoneal membrane was detached from the ileocecal region in the direction of the ligament of Treitz. The organs in the abdominal cavity were mobilized to the left to expose the entire aortic aneurysm (the Cattell-Braasch maneuver; Fig 2). The hepatoduodenal ligament and left renal vein were mobilized, which allowed excellent surgical exposure of the proximal infrarenal aortic neck. Although the proximal neck was bent, it was easily isolated (Fig 3). The bilateral external iliac arteries were also exposed. After systemic heparinization, the bilateral iliac arteries were clamped, and aortic cross-clamping was performed just below the lower renal artery. The aneurysm was opened. The aneurysm was replaced with a 16- × 8-mm Y-shaped vascular prosthesis (J Graft SHIELD NEO; Japan Lifeline Co, Ltd, Tokyo, Japan). The distal side was reconstructed through anastomosis of the graft legs to the bilateral external iliac arteries and closure of the stumps of the bilateral common iliac arteries (Video). The operative time was 273 minutes, and total blood loss was 2346 mL. Postoperatively, resumption of oral food intake was delayed because of dysphagia and paralytic ileus. Her condition eventually improved with conservative treatment. She started tube feeding from postoperative day 14. Oral food intake was able to be started from postoperative day 21. CT performed after the operation showed complete revascularization (Fig 4). We had much time to arrange the next medical institution for her. She was discharged on postoperative day 50.

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Author conflict of interest: none.

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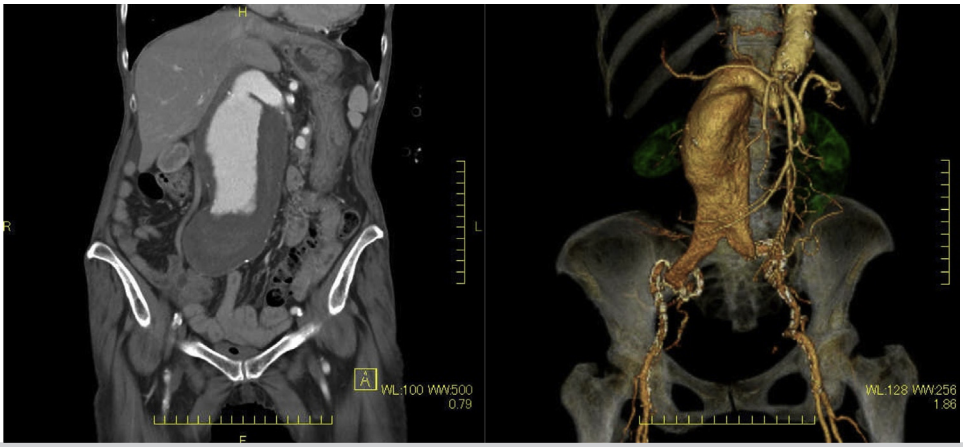

Fig 1. Contrast-enhanced computed tomography (CT) and reconstructed three-dimensional images showing a 78-mm infrarenal abdominal aortic aneurysm (AAA) and a 55-mm aneurysm in the right common iliac artery. The proximal infrarenal aortic neck is reaching the hepatic portal region and bending into a reverse S shape.

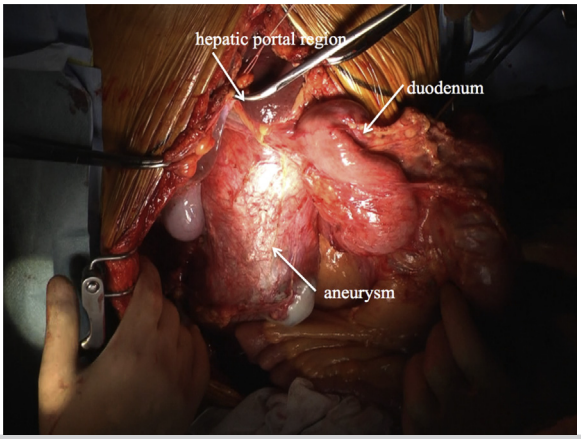

Fig 2. Intraoperative photograph on completion of the Cattell-Braasch maneuver.

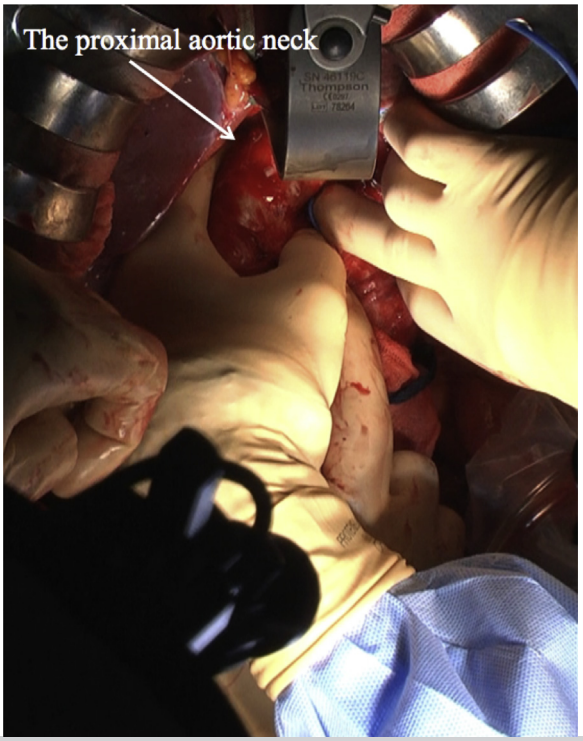

Fig 3. Intraoperative photograph on exposure of the proximal aortic neck.

DISCUSSION

Endovascular repair of a huge AAA is often difficult for anatomic reasons, and open repair is a good option for treatment in these cases. The approaches for open repair are broadly classified into transperitoneal and retroperitoneal approaches, and the advantages and disadvantages of each approach have been discussed previously.[4] In this case, we thought that laparotomy with a transperitoneal approach would cause the intra-abdominal organs to obscure the field of view because the proximal infrarenal aortic neck was located in the upper abdomen. On the other hand, the retroperitoneal approach has the advantage of aortic dissection free of intra-abdominal organs, although it would be difficult to maneuver the tortuous proximal neck and bilateral external iliac arteries at the same time. Therefore, we decided to perform laparotomy with the Cattell-Braasch maneuver. The Cattell-Braasch maneuver is one of the mobilization surgical techniques. This technique allows good access to the retroperitoneal structures. The inferior vena cava, abdominal aorta below the superior mesenteric artery, and retroperitoneal organs of the right side are exposed when it is completed.[2] Laparotomy with the Cattell-Braasch maneuver allowed straightforward manipulation of the proximal infrarenal neck and the bilateral external iliac arteries. In addition, it enabled mobilization of the pancreas, duodenum, and

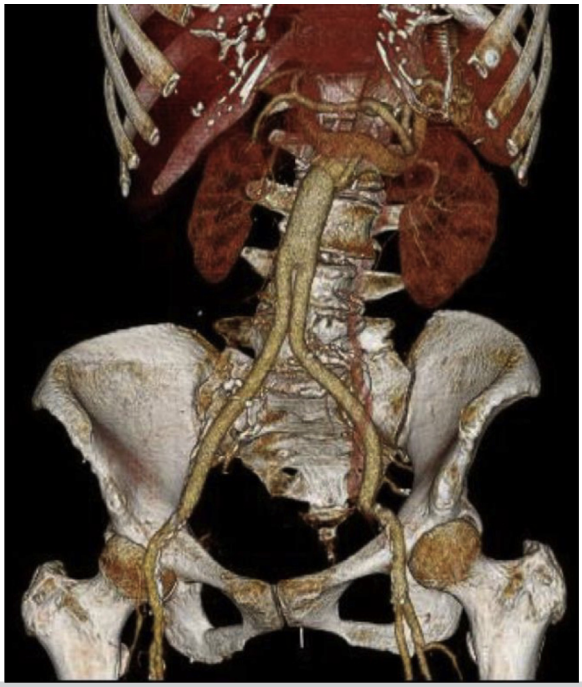

Fig 4. Reconstructed three-dimensional image showing complete revascularization.

transverse mesocolon, which were obscuring the view of the aneurysm. Thus, this approach may be simple and effective for an AAA with a tortuous proximal infrarenal aortic neck and when it is complicated by aneurysm or stenosis of bilateral common iliac arteries. Endo et al[5] reported a modified retroperitoneal approach for open repair. This is a midline incision right retroperitoneal approach that enables exposure of the bilateral external iliac arteries without another incision. This technique could be considered an alternative option. However, this technique is technically difficult compared with laparotomy with the Cattell-Braasch maneuver because of the broad dissection of retroperitoneum.

A disadvantage of laparotomy with the Cattell-Braasch maneuver may be delayed recovery of gastrointestinal function. Recovery has been reported to be slower with the transperitoneal approach than with the retroperitoneal approach.[6,7] This approach also involves extensive retroperitoneal separation in addition to laparotomy, which may further delay the recovery of gastrointestinal function. On the other hand, the Cattell-Braasch maneuver has been used in the fields of gastroenterologic surgery and trauma surgery. However, gastrointestinal function after the Cattell-Braasch maneuver remains controversial, and only a few cases have been described in the literature. In this case, although resumption of oral food intake was delayed because of paralytic ileus, the patient's condition improved with conservative treatment. As this report involved a single case, no definite conclusions can be made regarding the delayed recovery of gastrointestinal function with the Cattell-Braasch maneuver.

CONCLUSIONS

We performed open repair for a huge infrarenal AAA, using laparotomy with the Cattell-Braasch maneuver. This approach is simple and effective in open repair of a huge AAA extending into the right common iliac artery, for which proximal clamping is difficult because of a tortuous proximal neck just below the hepatic region.

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