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Iatrogenic Left External Iliac Artery Dissection Following Robot-Assisted Surgery for Endometrial Cancer: A Case Report

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Abstract

Major vascular injury is a rare but potentially serious complication of minimally invasive gynecologic surgery. Most reported vascular injuries occur during abdominal entry or result from direct vessel injury; however, delayed arterial dissection and occlusion following pelvic lymphadenectomy are extremely uncommon. We report a case of external iliac artery dissection and occlusion after robot-assisted surgery for endometrial cancer. A woman in her 60s presented with abnormal uterine bleeding and was diagnosed with grade 2 endometrioid carcinoma. Preoperative imaging showed less than 50% myometrial invasion without evidence of lymph node or distant metastasis, corresponding to clinical stage IA disease. She underwent robot-assisted surgery with pelvic lymphadenectomy. The operative time was 349 minutes, and estimated blood loss was 83 mL. Final pathology revealed grade 2 endometrioid carcinoma with myometrial invasion, no lymphovascular space invasion, negative surgical margins, and no lymph node metastasis in 44 resected lymph nodes. Postoperatively, she received three cycles of paclitaxel and carboplatin. After surgery, she developed persistent paresthesia in the left inguinal region and difficulty climbing stairs. These symptoms were initially considered consistent with transient genitofemoral or obturator nerve dysfunction associated with pelvic lymphadenectomy, and she was therefore observed conservatively. However, the symptoms persisted after completion of chemotherapy. Contrast-enhanced computed tomography subsequently demonstrated a localized dissection at the origin of the left external iliac artery with arterial occlusion. She was referred to vascular surgery and managed conservatively with cilostazol. This case highlights that external iliac artery dissection and occlusion should be considered in the differential diagnosis of persistent lower-extremity sensory or exertional symptoms following pelvic lymphadenectomy. In robot-assisted surgery, the absence of tactile feedback and the substantial force exerted by robotic instruments may increase the risk of unrecognized vessel compression. Careful handling of the iliac vessels and early vascular imaging should be considered when postoperative symptoms persist.

Categories: Obstetrics/Gynecology
Keywords: endometrial cancer (ec), iatrogenic arterial injury, isolated dissection of the iliac artery, pelvic lymphadenectomy, robot-assisted surgery

Introduction

Robot-assisted surgery has become widely adopted in gynecologic oncology because it provides excellent visualization and instrument maneuverability while preserving the advantages of minimally invasive surgery. Accurate assessment of lymph node metastasis is essential for appropriate staging and treatment planning in endometrial cancer, and pelvic lymphadenectomy remains an important surgical approach in selected patients. This procedure requires dissection of lymphatic tissue along the iliac vessels, placing these major vascular structures in close proximity to surgical instruments. Nevertheless, pelvic lymphadenectomy is associated with several complications, including lower-extremity lymphedema, lymphocele formation, lymphatic leakage, and nerve injury. Major vascular injuries are less common but can result in substantial morbidity.

Most major vascular injuries during laparoscopic surgery occur during abdominal entry, particularly during insertion of a Veress needle or primary trocar [1,2]. Injuries to the aorta, vena cava, and iliac vessels have also been reported during retroperitoneal dissection and lymphadenectomy [3]. In contrast, arterial dissection caused by blunt compression or traction without obvious intraoperative bleeding is extremely rare. Blunt vascular injury may disrupt the arterial intima, leading to intimal flap formation and subsequent thrombosis, which can ultimately result in arterial stenosis or occlusion. Because such injuries may present as delayed arterial stenosis or occlusion rather than acute hemorrhage, they can be difficult to recognize.

Robot-assisted surgery poses a particular concern because the surgeon lacks direct tactile feedback. Excessive compression or traction may therefore be applied to major vessels by robotic instruments without being immediately recognized. External iliac artery dissection following robot-assisted pelvic surgery has been reported in the urologic literature, highlighting this potential mechanism [4].

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Here, we report a rare case of left external iliac artery dissection with subsequent occlusion following robot-assisted surgery with pelvic lymphadenectomy for endometrial cancer. The postoperative symptoms were initially interpreted as neurological complications associated with lymphadenectomy, resulting in delayed vascular imaging. This case highlights the importance of considering arterial injury in patients with persistent lower-extremity symptoms after pelvic lymphadenectomy.

Case Presentation

A woman in her 60s, gravida 2 para 2, presented with abnormal uterine bleeding. She was 157.7 cm tall, weighed 48.9 kg, and had a body mass index (BMI) of 19.7 kg/m^2. Her medical history was unremarkable. Endometrial biopsy revealed grade 2 endometrioid carcinoma. Preoperative imaging demonstrated less than 50% myometrial invasion, with no evidence of lymph node or distant metastasis. The preoperative diagnosis was stage IA endometrial cancer (cT1aN0M0).

Robot-assisted surgery for endometrial cancer, including pelvic lymphadenectomy, was performed using the da Vinci Xi surgical system (Intuitive Surgical, Sunnyvale, CA, USA). The patient was placed in the lithotomy position with a 20°-25° Trendelenburg tilt. The operative time was 349 minutes, and the estimated blood loss was 83 mL. No apparent major vascular injury or significant intraoperative hemorrhage was observed.

Final histopathological examination revealed grade 2 endometrioid carcinoma with more than 50% myometrial invasion, no lymphovascular space invasion, negative surgical margins, and no lymph node metastasis (0/44), corresponding to the International Federation of Gynecology and Obstetrics (FIGO) 2008 stage IB (pT1bN0). Peritoneal washing cytology was negative. The patient subsequently received three cycles of paclitaxel plus carboplatin as postoperative adjuvant chemotherapy.

Several weeks after surgery, the patient developed mild paresthesia, described as a tingling sensation, in the left inguinal region and reported difficulty climbing stairs. These symptoms persisted during the postoperative course. The symptoms were not typical of intermittent claudication, and no findings suggested acute limb ischemia. Therefore, transient injury to the left genitofemoral and/or obturator nerve associated with pelvic lymphadenectomy was initially suspected, and the patient was observed conservatively.

At three months postoperatively, the symptoms persisted despite completion of three cycles of chemotherapy. Contrast-enhanced computed tomography (CT) was therefore performed to investigate the cause of the persistent symptoms. CT demonstrated a localized dissection at the origin of the left external iliac artery with occlusion of the artery. Comparison with preoperative CT confirmed that the left external iliac artery had been patent before surgery (Figure *1*).

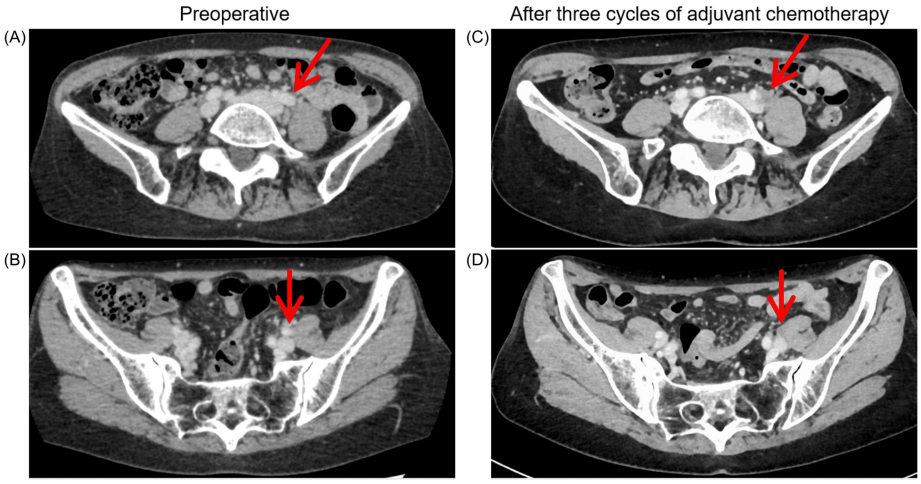


FIGURE 1: Contrast-enhanced CT imaging before and after robot-assisted surgery.

Preoperative contrast-enhanced CT demonstrated a patent left external iliac artery without stenosis or dissection (A, B). CT performed three months after surgery demonstrated localized dissection near the origin of the left external iliac artery with subsequent arterial occlusion (C, D). Arrows indicate the patent left external iliac artery on preoperative images and the affected arterial segment with occlusion on postoperative images.

The patient was referred to the vascular surgery department. Because there was no evidence of acute limb-threatening ischemia, conservative management was selected. Cilostazol was initiated, and the patient was

followed clinically.

Discussion

Major vascular injury is one of the most serious complications of laparoscopic and robot-assisted surgery, although its incidence is low. Previous studies have reported an incidence of approximately 0.04%-0.5% during laparoscopic surgery [1,5,6]. Many injuries occur during initial abdominal access with a Veress needle or trocar, and iliac arterial injuries represent a substantial proportion of vascular injuries associated with laparoscopic entry [2,6]. Among these complications, iliac vascular injuries are particularly important because of their potentially severe consequences and the need for prompt recognition and management [7].

The mechanism in the present case appears to differ from that of a conventional penetrating vascular injury. There was no intraoperative hemorrhage or recognized direct vessel injury. Instead, postoperative CT demonstrated a localized dissection near the origin of the left external iliac artery with subsequent occlusion. Blunt compression or traction of the arterial wall during pelvic lymphadenectomy was therefore considered the most likely mechanism (Figure *2*). Blunt arterial injury can occur when a vessel is compressed between an external force and a rigid underlying structure. Shear stress may disrupt the intima and create an intimal flap, subsequently leading to thrombosis and luminal occlusion [8].

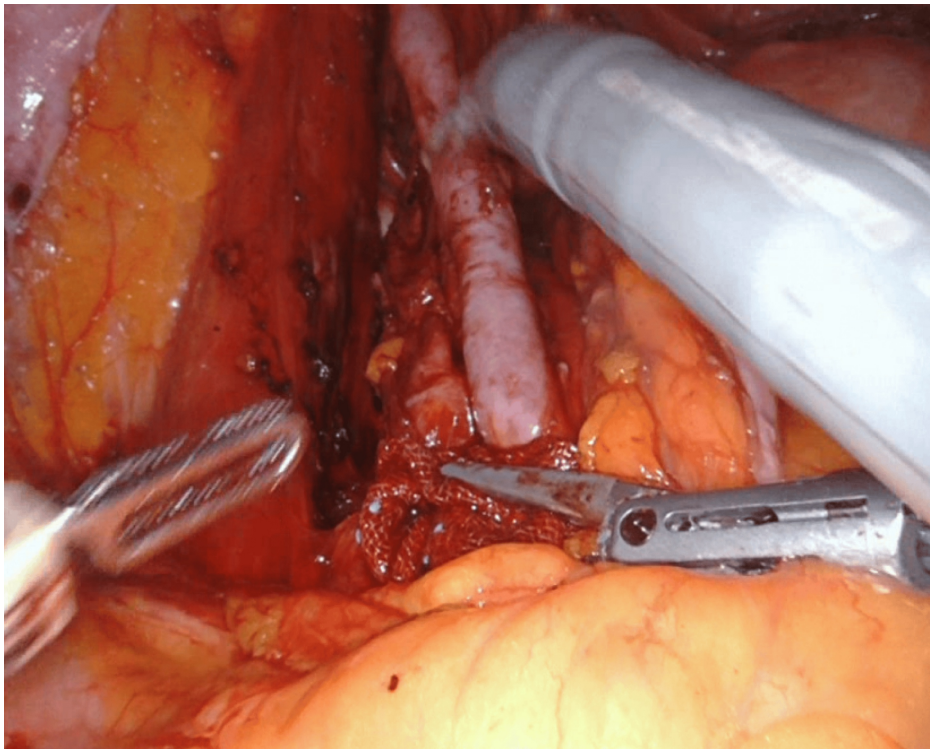


FIGURE 2: Intraoperative view during left pelvic lymphadenectomy.

The intraoperative image demonstrates the left external iliac artery during robot-assisted pelvic lymphadenectomy. The vessel sealer, located in the lower right portion of the image, is in contact with the left external iliac artery. This image illustrates a possible mechanism of mechanical vascular injury during robotic manipulation; however, direct causation cannot be definitively established.

A particularly relevant case was reported by Nakashima et al., who described external iliac artery dissection and thrombotic occlusion following robot-assisted radical cystectomy with extended pelvic lymph node dissection [4]. In that case, traction on a tortuous external iliac artery during lymphadenectomy was suspected to have contributed to the injury. Although the surgical procedure differed from that in our patient, the report supports the possibility that robot-assisted pelvic lymphadenectomy can cause arterial dissection without penetrating injury.

The robotic platform may theoretically increase this risk under certain circumstances. Although robotic systems provide magnified three-dimensional visualization and highly articulated instruments, tactile feedback is limited. As a result, the force applied to vascular structures may be underestimated. During pelvic lymphadenectomy, inadvertent focal compression or excessive traction on the external iliac artery may impose substantial mechanical stress on the vessel.

Another important aspect of this case is the delayed diagnosis. Acute arterial occlusion classically presents with the "five Ps": pain, pulselessness, pallor, paresthesia, and paralysis. However, slowly developing or partially compensated arterial occlusion may present more subtly. In this patient, left inguinal paresthesia and difficulty climbing stairs were initially attributed to genitofemoral or obturator nerve dysfunction, both recognized complications of pelvic lymphadenectomy. The absence of severe limb pain or obvious intermittent claudication further delayed recognition.

This overlap in clinical presentation is particularly important in gynecologic oncology. Persistent unilateral paresthesia, weakness, difficulty walking or climbing stairs, exertional discomfort, or other atypical lower-extremity symptoms should prompt assessment not only for nerve injury but also for arterial insufficiency. Examination of peripheral pulses and, when indicated, measurement of the ankle-brachial index or contrast-enhanced CT may facilitate earlier diagnosis.

Management of external iliac artery dissection depends on the severity of ischemia, anatomical findings, symptoms, and clinical course. Treatment options include medical therapy, endovascular intervention, and open surgical revascularization. In the previously reported case of external iliac artery dissection following robot-assisted pelvic lymphadenectomy, acute limb ischemia required thrombectomy and stent placement [4]. In contrast, a recent case report demonstrated that uncomplicated external iliac artery dissection without significant limb ischemia could be managed conservatively [9]. Although the incidence of external iliac artery dissection specifically associated with robot-assisted pelvic lymphadenectomy remains unclear because of the limited number of reported cases, these findings suggest that management should be individualized according to clinical severity rather than the presence of arterial dissection alone. In our patient, the clinical course was relatively stable without evidence of acute limb-threatening ischemia, and conservative management with cilostazol was selected following consultation with vascular surgeons.

The present case has several limitations. Although the temporal relationship between surgery and the newly identified arterial lesion strongly suggests an iatrogenic mechanism, the precise intraoperative event responsible for the dissection was not observed. Therefore, direct compression by a robotic instrument cannot be definitively established. Nevertheless, the absence of arterial abnormalities on preoperative imaging, the development of symptoms after surgery, and the subsequent identification of focal dissection and occlusion make surgery-associated mechanical injury the most plausible explanation. Another limitation is the lack of detailed neurovascular examination findings, including objective assessments of peripheral perfusion, which limits our ability to fully characterize the initial clinical presentation and distinguish vascular insufficiency from postoperative nerve injury. Furthermore, the absence of these objective data limits retrospective evaluation of the severity of arterial insufficiency at symptom onset.

Conclusions

External iliac artery dissection and subsequent occlusion may occur following robot-assisted pelvic lymphadenectomy, even in the absence of recognized intraoperative vascular injury. Mechanical compression or traction is a plausible mechanism of arterial injury, although the precise cause could not be established in this case. Careful handling of major pelvic vessels is warranted during robot-assisted surgery, particularly given the absence of tactile feedback. When persistent unilateral lower-extremity symptoms develop after pelvic lymphadenectomy, vascular complications should be considered alongside neurological injury, and early vascular assessment and appropriate imaging should be considered to avoid delayed diagnosis.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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Disclosures

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