

Temporary Uterine Artery Ligation to Reduce Intraoperative Blood Loss During Robotic Assisted Laparoscopic Myomectomy or Hysterectomy: Different Surgical Approaches

Johansson CY¹ and Chan FC^{2,3}

1. Minimally Invasive Gynaecology Unit, Liverpool Hospital, Liverpool NSW 2170. 2. Westmead Private Hospital, Westmead NSW 2145. 3. Macquarie University Hospital, Macquarie Park NSW 2113.

Background

Uterine artery ligation is an important consideration in the management of blood loss associated with complex gynaecological procedures. Understanding of the surgical landmarks and knowledge of anatomy are essential to the safe and efficient isolation of the uterine artery, as the retroperitoneal anatomy is relatively constant.

Aims

To review the pelvic avascular spaces and vascular anatomy and to demonstrate various approaches to robotic-assisted laparoscopic uterine artery ligation.

Review of Pelvic Vascular Anatomy and Relevant Pelvic Spaces

Figure 1 schematically illustrates the main pelvic vasculature and pelvic spaces encountered in the pelvic side wall. The aorta bifurcates into the common iliac trunks, which in turn bifurcate into internal and external iliac arteries. The internal iliac artery has anterior and posterior divisions. The anterior division continues to become the obliterated umbilical artery and the first medial branch is the uterine artery, which divides the paravesical and the pararectal spaces. The ureter courses underneath the uterine artery, further dividing these spaces into medial and lateral spaces.

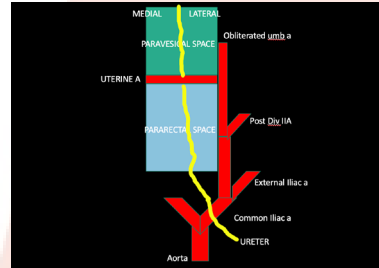


Figure 1. Pelvic vasculature and spaces

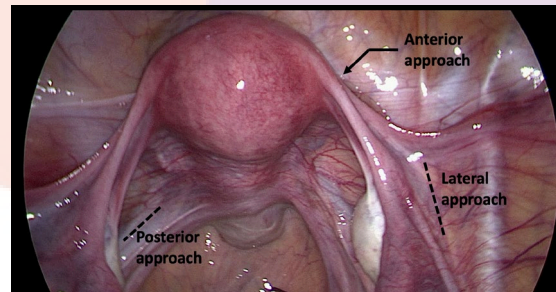


Figure 2. Three approaches to the uterine artery

Results:

Three approaches to the isolation of the uterine artery are illustrated by Figure 2. Once identified, it can be temporarily ligated using sutures, haemostatic staples or vascular clips.

(1) Posterior (or Medial) Approach:

The retroperitoneum is entered via the posterior leaf of the broad ligament medial to the infundibulopelvic ligament (IPL). The ureter and uterine artery are identified after dissecting the pararectal space.

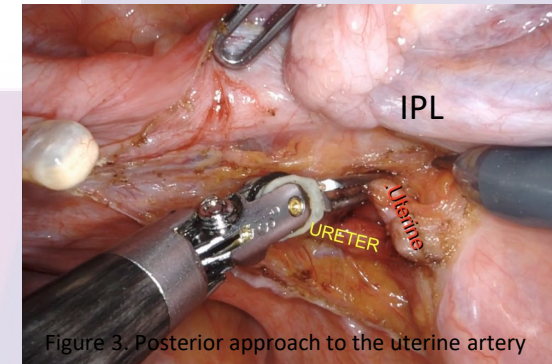


Figure 3. Posterior approach to the uterine artery

(2) Anterior Approach:

The peritoneum of the uteros vesical fold is opened over the uterine vessels where they can be seen anterior and lateral to the cervix.

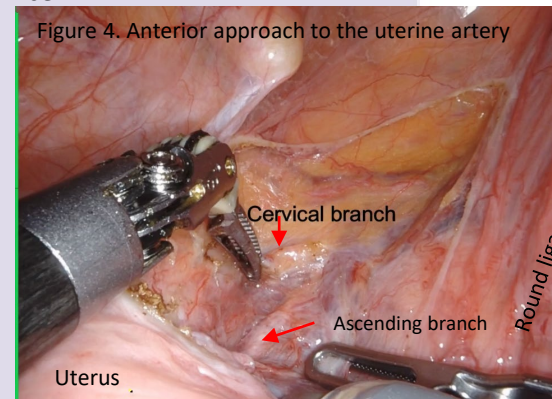


Figure 4. Anterior approach to the uterine artery

(3) Lateral Approach:

The broad ligament is opened in the triangle formed by the round ligament, the external iliac vessels and the IPL. Dissection of the paravesical and pararectal spaces reveals the ureter and uterine artery

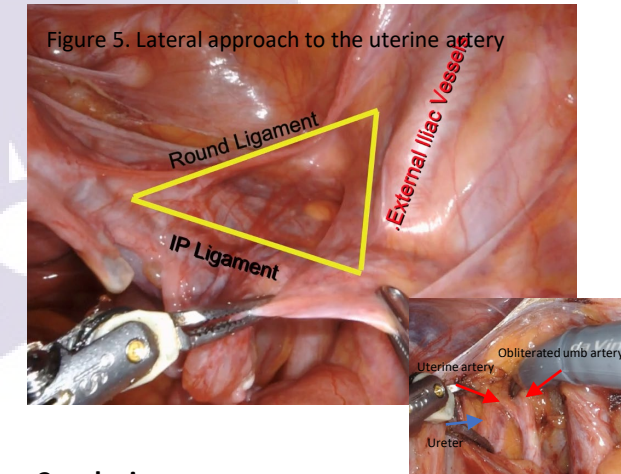


Figure 5. Lateral approach to the uterine artery

Conclusion

Uterine Artery ligation may be performed to reduce intraoperative blood loss. Knowledge of uterine artery anatomy and avascular pelvic spaces is essential for advanced laparoscopic surgery. Different approaches may be used depending on the patient's pathology and indications. Robotic assisted laparoscopy allows these techniques to be performed with precision and consistency.

References

1. Kongnyng EJ, Wiysonge CS. Interventions to reduce haemorrhage during myomectomy for fibroids. Cochrane Database of Systematic Reviews 2014; Issue 8 art no: CD 005355.
2. Shroff RR, Rossi EC. Bilateral uterine artery ligation: A simplified approach (Abstract). J Minim Inv Surg. 2012; Vol 19 (6): S124.
3. Grover H, Syed R, Padmawav A. Various approaches to uterine artery ligation at laparoscopy. Websurg.com epublication, May 2019; 19(05).