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## Case Series

# The interest of uterine artery ligation in gynecological surgery: the experience of Obstetrics and Gynecology Department at Mohammed VI University Hospital in Oujda, Morocco

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## ABSTRACT

Ligation of the uterine arteries is the placement of a clip or a ligature on the uterine artery allowing the devascularization of the irrigated area of the uterus. Indeed, in order to limit uterine bleeding during a myomectomy or a difficult hysterectomy, primary ligation of the uterine arteries is proved helpful. Our work aimed to discuss the indications for artery ligation uterine, describe its different techniques and assess its effectiveness and benefit. Our work was a retrospective analytical descriptive and mono-centered study, involving 21 patients who underwent vascular ligation of the uterine artery, as first stage of surgery, regardless of the approach, as part of a myomectomy/polymyomectomy or hysterectomy, in the Gynecology And Obstetrics Department at the Mohammed VI University Hospital of Oujda, over a period of thirty-four months, going from January 2019 to October 2021. The average age of the patients in our study was 39 years old. 66.7% of patients benefited from a myomectomy/polymyomectomy while 28.5% underwent a hysterectomy. The first technic was laparoscopy in 52.3% of cases and the second laparotomy in 47.7% of cases. The ligation of the uterine arteries was performed bilaterally, permanently by vascular clips in all patients. Blood loss was estimated to be 121 ml on average with extremes of 45 and 350ml, the hemoglobin level decreased by an average of 0.7 g/dl and none of the patients in our study required an intraoperative or postoperative transfusion. Occlusion of the uterine arteries seems to have a remarkable effect in reducing blood loss during gynecological surgery and does not increase the risk of intra or postoperative complications. However, more studies are required to assess its impact on subsequent fertility.

**Keywords:** Uterine artery, Ligation, Surgical clip, Blood loss

## INTRODUCTION

Uterine artery ligation is the placing of a clip or ligature on the uterine artery, thus allowing the devascularization of the irrigated area of the uterus. In fact, primary ligation of the uterine arteries can be useful in order to limit uterine hemorrhage during a myomectomy or a difficult hysterectomy.<sup>1</sup>

Our work aimed to discuss the indications of uterine artery ligation, to describe its different techniques and to evaluate its effectiveness and interest in gynecological surgery.

## CASE SERIES

We conducted a retrospective analytical and single-center descriptive study in the Obstetrics Gynecology

Department at Mohammed VI University Hospital in Oujda over a period of 34 months going from January 2019 to October 2021. We included all gynecological surgical procedures that involved preventive ligation of the uterine arteries as the first operation whether in the context of a myomectomy/polymyomectomy, a hysterectomy or cases of ectopic pregnancy on an old cesarean scar. We excluded patients who had undergone conservative or radical surgery without primary ligation of the uterine arteries, and patients who had undergone uterine artery ligation.

The average age of the patients in our study was 39 years old with extremes of 28 and 53 years old. The most represented age group was that of 30 to 39 years.

The majority of our patients were nulliparous with a percentage of 42.9%.

All the patients consulted for functional signs dominated by metrorrhagia, whether isolated or associated with pelvic pain. In the same patient, several symptoms could be found (Table 1).

**Table 1: Consultation reasons.**

Initial symptomatology	Number of patients	%
Isolated genital bleeding	5	23.8
Pelvic pain	3	14.3
Genital bleeding+pelvic pain	8	38
Dysmenorrhea	3	14.3
Abdominal-pelvic mass with signs of pelvic compression (urinary problems)	1	4.8
Primary sterility	1	4.8
Luckily found	0	0

**Table 2: Intraoperative blood loss.**

Blood loss (ml)	Number of patients	%
Blood traces	6	28.6
Between 50 and 150	10	47.6
Between 150 and 300	4	19
More than 300	1	4.8

**Table 3: Length of hospitalization.**

Length (days)	Number of patients	%
2	2	9.5
4	13	61.9
5	5	23.8
8	1	4.8

90.4% of our patients had a good general condition.

All the patients in our study underwent a gynecological, somatic clinical examination, and a pelvic ultrasound, either suprapubic or endovaginal.

The uterine pathologies found were myomatous or polymyomatous uterus with a rate of 71.4% (15 cases), followed by adenomyotic uterus 9.5% (3 cases) and finally a single case of pregnancy on scar.

**Table 4: Comparison of preoperative blood loss average.**

Comparison	The preoperative blood loss average in ml
Sanders et al <sup>3</sup>	107.3
Chang et al <sup>5</sup>	84
Yang et al <sup>4</sup>	83.6
Akinola	202
Our study	121

**Table 5: Comparison of intraoperative transfusion risk.**

Comparison	Intraoperative transfusion risk (%)
Sanders et al <sup>3</sup>	5
Chang et al <sup>5</sup>	1.8
Yang et al <sup>4</sup>	0
Our study	0

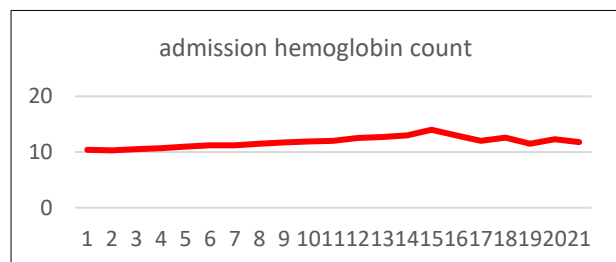
A pelvic MRI was performed in patients with a polymyomatous uterus (17 cases). This allowed the determination of fibroid mapping for a more objective description of the location, number and type of uterine fibroids.

All our patients benefited from a complete preoperative assessment made of CBC, ABO/Rh grouping, hemostasis assessment and renal assessment.

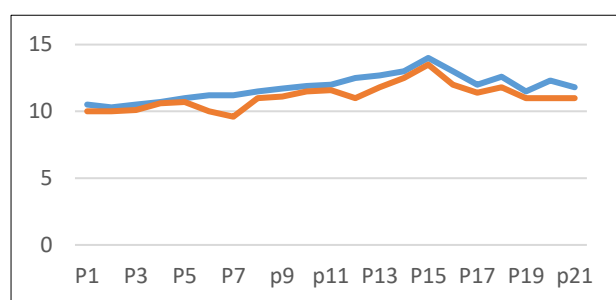
For the surgical management, uterine artery ligation was performed as a first surgery; bilaterally and preventively among all our patients bilaterally.

This ligation was permanent for all our patients by placing clips using the M or L clip applicator in laparotomy and using the 5 mm or 10 mm ligaclip of 35 length in laparoscopy. 66.7% of our patients benefited from a myomectomy or polymyomectomy, while a hysterectomy was performed among 28.6% of our patients and a complete resection of the scar and the trophoblastic tissue was performed in a single case of 8 weeks of amenorrhea ectopic pregnancy on an old caesarean section scar. The most used approach was laparoscopy with a rate of 52.3%, followed by laparotomy with a rate of 47.8%. The ligation of the uterine arteries was performed by posterior approach in 66.7%, by anterior approach in 23.8%, and 9.5% by lateral approach. Intraoperative blood loss during and after

bilateral uterine artery ligation was minimal in the majority of cases; estimated at 121 ml on average (Table 2).



**Figure 1: Admission hemoglobin count.**



**Figure 2: Variation in hemoglobin level pre and postoperatively.**

Among our patients, no intraoperative transfusion was required, no lesion or wound of neighboring organ was noted, no cases of conversion from myomectomy to hysterectomy was found and no conversion from laparoscopy to laparotomy was needed. The immediate postoperative evolution was simple in 95.2% of our patients.

All our patients benefited from biological monitoring the day after the intervention. This monitoring allowed us to estimate on average the decrease in hemoglobin level which was 0.7 g/dl.

## DISCUSSION

Several mechanical procedures had proven their effectiveness in terms of reducing intraoperative blood loss, in particular the Bonney technique, the tourniquet technique and in particular the ligation of the uterine arteries.<sup>2,10</sup> A recent meta-analysis of 25 studies conducted by Sanders et al had indeed objectified a significant reduction in blood loss after ligation of the uterine arteries which was estimated at 103.7 ml on average.<sup>3</sup>

This reduction in blood loss induced a less significant drop in the postoperative hemoglobin level which was estimated at 0.6 g/dl and thus a lower intraoperative transfusion risk estimated at 5%, which agreed with the results of our study, that objectified a significant decrease in blood loss and which could be justified by the decrease in uterine blood flow by ligation of the uterine arteries.<sup>3</sup>

It had been shown in the literature that the use of uterine artery ligation in gynecological surgery did not increase the risk of intraoperative complications.<sup>3</sup> We found no cases of conversion from myomectomy to hysterectomy in our study, unlike Lisa Caronia Hickman's study which noted a conversion rate to hysterectomy of 2%.<sup>6</sup>

Conversion from laparoscopy to laparotomy was not performed in any of our patients, which was consistent with the South Korean study by Bae.<sup>7</sup>

The hospitalization duration average was 3.9 days in our study, which adhered to the study of Liu et al with an average duration of 3.8 days and remained lower compared to the duration hospitalization of 5 days reported by Yang et al.<sup>4,8</sup>

## CONCLUSION

Several approaches to the uterine artery were used in our study. The posterior approach consists of approaching the uterine artery via the lower part of the posterior leaflet of the broad ligament. The lateral approach involves a lateral peritoneal incision between the round ligament in front, the infundibulopelvic ligament inside and the pelvic wall outside. The anterior approach is through the top of the broad ligament, and is used when access to the posterior broad ligament and the lateral wall of the pelvis is difficult. Some authors suggest temporary occlusion of the uterine arteries by only moderately tightening the clip in order to remove it at the end of the operation, but the risk of vascular trauma remains high. The ligation was definitive in our study, and we did not note any case of ischemia or other complications, in fact, there is no argument to confirm that transient ischemic devascularization is less harmful for the myometrium and fertility than a definitive occlusion, due to rapid recanalization by the collaterals.

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## REFERENCES

1. Dubuisson JB, Malartic C, Jacob S, Chapron C, Rambaud D. Preventive uterine artery occlusion combined with laparoscopic myomectomy: a valid procedure to prevent bleeding. *J Gynecol Surg.* 2004;20(4):105-12.
2. Jan H, Ghai V. The approach to uterine artery ligation. *J Minimal Invas Gynecol.* 2019;26(7):22.
3. Sanders AP, Chan WV, Tang J, Murji A. Surgical outcomes after uterine artery occlusion at the time of myomectomy: systematic review and meta-analysis. *Fertil Steril.* 2019;111(4):816-27.
4. Yang W, Cheng Z, Yu J, Yang H, Liu Z, Ren Q, et al. Multicentre study to evaluate the clinical effects of laparoscopic uterine artery occlusion in combination with myomectomy to treat symptomatic uterine

- leiomyomas. *Eur J Obstetr Gynecol Reproduct Biol.* 2016;204:9-15.
5. Chang WC, Huang PS, Wang PH, Chang DY, Huang SC, Chen SY, et al. Comparison of laparoscopic myomectomy using in situ morcellation with and without uterine artery ligation for treatment of symptomatic myomas. *J Minimal Invas Gynecol.* 2012;19(6):715-21.
  6. Hickman LC, Kotlyar A, Shue S, Falcone T. Hemostatic techniques for myomectomy: an evidence-based approach. *J Minimal Invas Gynecol.* 2016;23(4):497-504.
  7. Bae JH, Chong GO, Seong WJ, Hong DG, Lee YS. Benefit of uterine artery ligation in laparoscopic myomectomy. *Fertil Steril.* 2011;95(2):775-8.
  8. Wang Y, Deng L, Xu H, Chen Y, Liang Z. Laparoscopic transient uterine artery occlusion and myomectomy for symptomatic uterine myoma as an alternative to hysterectomy. *Approach Hysterect.* 2015.
  9. Dubuisson JB. How I perform the preventive occlusion of the uterine arteries before myomectomy or hysterectomy? *Gynecologie Obstetrique Fertilité.* 2007;35(12):1264-7.
  10. Fanny M, Fomba M, Aka E, Adjoussou S, Olou L, Koffi A, et al. Prévention de l'hémorragie per myomectomie en Afrique subsaharienne: apport du garrot sur l'isthme utérin. *Gynécologie Obstétrique Fertilité Sénologie.* 2018;46(10-11):681-5.
  11. Aust T, Reyftmann L, Rosen D, Cario G, Chou D. Anterior approach to laparoscopic uterine artery ligation. *J Minimal Invas Gynecol.* 2011;18(6):792-5.
  12. Chene G, Nohuz E, Lamblin G, Provost M, Cerruto E, Lebail-Carval K, et al. How I do easily a laparoscopic myomectomy without blood loss. *Gynecologie Obstetrique Fertilité Senologie.* 2019;47(9):700-3.

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