

# Laparoscopic Management of Rudimentary Horn Pregnancy Via “Noose” Technique: Case Report

## Rudimenter Horn Gebeliğinin “Kement” Tekniği ile Laparoskopik Eksizyonu

Murat APİ,<sup>a</sup>  
Ayşen BOZA<sup>b</sup>

<sup>a</sup>Clinic of Obstetrics and Gynecology, Zeynep Kamil Training and Research Hospital,

<sup>b</sup>Clinic of Obstetrics and Gynecology, Göztepe Training and Research Hospital, İstanbul

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Yazışma Adresi/Correspondence:  
Ayşen BOZA  
Göztepe Training and Research Hospital,  
Clinic of Obstetrics and Gynecology,  
İstanbul,  
TÜRKİYE/TURKEY  
aysenboza@hotmail.com

**ABSTRACT** Unicornuate uterus with a rudimentary horn is seen rarely among mullerian duct abnormalities. Pregnancy in a rudimentary horn occurs 1 in 76 000 pregnancies. Since it is very difficult to diagnose a rudimentary horn pregnancy and the risk of rupture increases as fetus enlarges, delay in diagnosis can cause serious gynecologic and obstetrical complications. Early diagnosis and surgical treatments are life saving interventions. Recently, laparoscopic treatments become gold standard with increasing expertise in laparoscopy. We present a case of 13-weeks viable pregnancy in a rudimentary horn connected to the uterus with a stalk and a new laparoscopic resection procedure, ‘Noose’ technique for the management of rudimentary horn pregnancy.

**Key Words:** Pregnancy; laparoscopy

**ÖZET** Rudimenter hornun eşlik ettiği unikornat uterus, mülleryen kanal anomalileri içinde nadiren görülür. Rudimenter horn gebeliği 76 000 gebelikte bir oluşur. Rudimenter horn gebeliğine tanı koymak zordur ve fetus büyüdükçe rüptür riski de arttığından, tanıda gecikme ciddi jinekolojik ve obstetrik komplikasyonlara sebep olabilir. Erken tanı ve cerrahi tedavi hayat kurtarıcı girişimlerdir. Yakın zamanda laparoskopi konusundaki deneyimin artması laparoskopik tedavileri altın standart haline getirmiştir. Biz bu yazıda, 13 haftalık, uterusu bir sap ile tutunan canlı bir rudimenter gebeliği ve bu gebeliğe müdahalede kullandığımız yeni bir laparoskopik yöntem olan ‘Kement’ tekniğini sunuyoruz.

**Anahtar Kelimeler:** Gebelik; laparoskopi

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The incidence of mullerian duct abnormalities in the fertile population has been reported as approximately 3.2%.<sup>1</sup> A unicornuate uterus with rudimentary horn is seen rarely. One cavity is usually normal, with a fallopian tube and cervix, while the failed duct has some configurations. Contralateral rudimentary horn exists in more than 75% of patients with unicornuate uterus.<sup>2,3</sup> Uterus with a rudimentary horn may have a communication or not.<sup>4</sup> The incidence of rudimentary horn pregnancy ranges from 1/76,000 to 1/150,000 pregnancies and most of the rudimentary horn pregnancy cases were non-communicating.<sup>5,6</sup> Transperitoneal transmigration of spermatozoa or fertilized ova from the contralateral side may cause pregnancy. Early diagnosis of rudimentary horn pregnancy is crucial

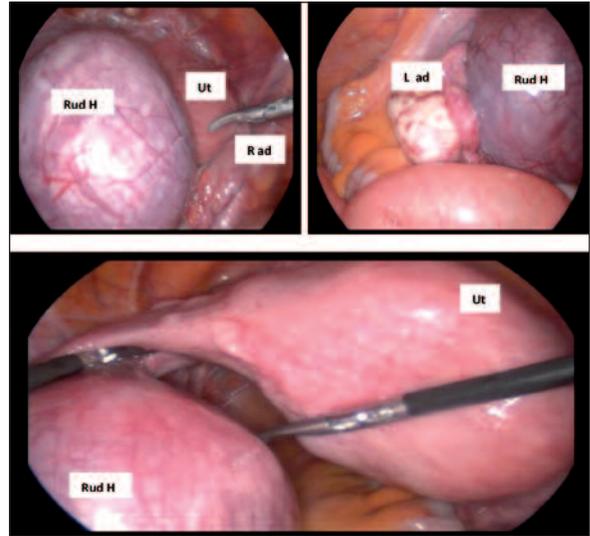
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because pregnancy within a non-communicating rudimentary horn has a 70% chance of rupture and carries a maternal mortality of approximately 0.5%.<sup>5</sup> At the time of diagnosis, standard intervention is surgical removal of the horn.<sup>7</sup> Laparoscopic treatments become gold standard with increasing expertise in laparoscopy, instead of laparotomy.<sup>8,9</sup> We present a case of 13-weeks pregnancy in a rudimentary horn connected to the uterus with a stalk and new laparoscopic resection procedure, 'Noose technique' for the management of rudimentary horn pregnancy.

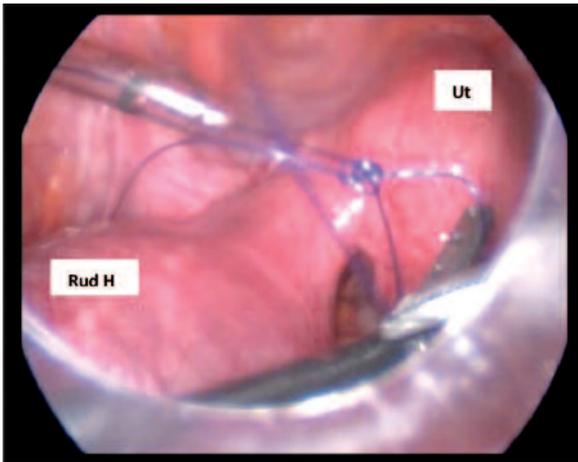
## CASE REPORT

A 24-years-old young nulliparous woman was applied to the emergency department with 15-weeks of amenorrhea and abdominal pain. At the physical examination, left adnexial tenderness and an adnexial mass was detected. There was no significant findings at urinary testing and complete blood count. Serum beta human chorionic gonadotropin level was 23500 mIU/mL. Ultrasonography revealed a 67-mm fetal crown-rump length corresponding to 13-weeks of gestation with positive fetal cardiac activity which placed at left adnexial area and right sided uterus with a hyperechoic endometrium 10-mm thick. The patient was undergone laparoscopy with the diagnosis of ectopic pregnancy. Under general anesthesia pneumoperitoneum was created and four laparoscopic ports were placed: 10-mm umbilical port and three 5-mm ports; two lateral and one left paraumbilical. At the time of laparoscopic surgery, a unicornuate right uterus with a normal ovary and fallopian tube and left sided, distended rudimentary horn about 12-cm long, connected to the uterus with a stalk were visualized (Figure 1). The adjacent tube and ovary appeared anatomically normal. Due to the presence of the stalk and single cervix, other mulierian anomalies were excluded. Two number 0 polypropylene ligating loop was placed at the margins between rudimentary horn and uterus. We preferred Roeder's knot (extracorporeal sliding knot) in our loop and namely "Noose" technique to secure tissue. The formula for making the Roeder's knot was (1:3:1) 'one hitch, three winds and one



**FIGURE 1:** Left sided rudimentary horn with normal uterus, tubes and ovaries. Rud H: Rudimentary horn; Ut: Uterus; R ad: Right adnex; L ad: Left adnex.

locking hitch'. Firstly, a loop was made around a post and then a simple knot was made. With the shorter end, three winds were made around both posts and were secured with the last half hitch. Knot was tightened and checked for sliding. Excess length of the string was trimmed. Knot was held in the grasper and, with grasper, it was slide down the trocar into the abdominal cavity. Inside the abdominal cavity, the loop was checked again whether it was placed around the structure to be ligated (rudimentary horn stalk). Free end of the string was passed through the eye of a knot pusher and knot pusher was slide through the trocar and knot was tightened to obtain avascularization. Then the horn was excised via scissor (Figure 2). The utero-ovarian, broad ligament and left round ligament were coagulated via bipolar coagulation and cut to leave left fallopian tube and ovary in situ. Lastly, the end of the knot was trimmed with scissors. This technique was described as 'Noose' technique. The excised rudimentary horn specimen was placed in an endoscopic bag, incised and suctioned, then pulled out through the enlarged left portal site. Patient was discharged from hospital postoperative second day without any problem. Written informed consent was obtained from the patient for the publication.



**FIGURE 2:** 2-0 polypropylene ligating loops at the margin between the rudimentary horn and uterus.

Rud H: Rudimentary horn; Ut: Uterus.

## DISCUSSION

Rudimentary uterine horn comprises approximately 3% of the müllerian duct anomalies.<sup>1</sup> Rudimentary horn pregnancy can cause life threatening hemorrhage because of uterine rupture resulting from weak musculature of rudimentary horn especially in second trimester as the fetus enlarges. Only 6% of rudimentary horn pregnancies proceed to term with neonatal survival ranging from 0 to 13%.<sup>2,5</sup>

Diagnosing a rudimentary horn pregnancy remains a challenge.<sup>10</sup> The clinical presentation varies from being asymptomatic to having an acute abdomen with hemorrhagic shock. Ultrasonography is only 29% sensitive in diagnosing rudimentary horn pregnancies.<sup>3</sup> If the challenge in diagnosis still remains after the ultrasonography, magnetic resonance imaging or computed tomography angiography may be beneficial in confirming diagnosis.<sup>11,12</sup> Despite newer imaging modalities, most of them are still diagnosed at surgery as in our case.

Once the diagnosis is made or suspected, prompt intervention decreases the rate of maternal mortality dramatically.<sup>5</sup> Recently, in the literature the number of rudimentary horn pregnancy treated with laparoscopic surgery is rising with increasing experience.<sup>7-9,13</sup> In excision of the uterine horn with laparoscopy, the procedure is performed via electro-surgery (bipolar forceps, Harmonic scalpel or a stapling device) successfully. Owing to the increased vascularity of the pregnant uterine horns, these instruments may provide for relatively bloodless surgery besides the risk of adjacent organ injury. Since 36% of patients with rudimentary horn are associated with renal anomalies, these anatomic variations can cause some morbidity such as urinary or adjacent organs injury in the course of providing hemostasis with different energy modalities.<sup>3</sup> In the literature, in most of the cases treated with laparoscopic surgery harmonic scalpel was commonly used.<sup>14</sup> In our case, electro-surgery (bipolar coagulation) was only used during coagulation of the ligaments and the excision of the rudimentary horn was performed via Noose technique without using any energy modality. As our knowledge, this is the first report in the literature where a pregnancy in a rudimentary horn is treated with laparoscopic Noose technique. Noose technique may provide some advantages: the vascularization of rudimentary horn is decreased by squeezing the loop around the connecting stalk, decreasing vascularization requires less coagulation which leads to provide safe surgical area and prevent possible thermal injury of adjacent organs. In order to mention its safety and efficacy, more reports need to be published on this technique.

In conclusion, in a hemodynamically stable rudimentary horn pregnancy, laparoscopy can be used as alternative to laparotomy in both confirmation of diagnosis and providing optimal management.

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