

Case Report

Hemostatic Techniques for Laparoscopic Management of Cornual Pregnancy: Double-Impact Devascularization Technique

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ABSTRACT Cornual pregnancy is a rare form of ectopic pregnancy, accounting for up to 2% to 4% of all ectopic pregnancies, with a mortality range of 2.0% to 2.5%. Hemorrhage is a key concern in the management of such pregnancies. Traditional treatment options include a conservative approach, failing which patients are offered surgical options such as cornual resection at laparotomy, which carries a high risk of hysterectomy. In recent years newer laparoscopic cornual resection or cornuotomy techniques have been used successfully to achieve better outcomes with fewer complications. We present the double-impact devascularization (DID) technique for laparoscopic management of cornual ectopic pregnancies. This technique permits hemostatic control by compression effect, which in turn allows reduction in procedure-related patient morbidity and mortality. We also provide an overview of other reported methods of hemostatic control used in similar laparoscopic procedures. DID appears to be a useful, safe, minimally invasive technique that can be used in both laparoscopic and open surgical procedures. Journal of Minimally Invasive Gynecology (2016) 23, 274–280 © 2016 AAGL. All rights reserved.

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Cornual or interstitial pregnancy is a rare but diagnostically challenging condition that can lead to catastrophic hemorrhage. Cornual pregnancies account for up to 2% to 4% of all ectopic pregnancies [1]. Most authors use the term cornual pregnancy interchangeably with interstitial pregnancy, whereas others refer to it only in relation to the horn of a bicornuate uterus. Angular pregnancy is another term that can be mistaken for a cornual pregnancy when in fact it is a type of intrauterine pregnancy where implantation occurs along the lateral angles of the uterus close to the uterofallopian junction. For the purpose of this article we have described a cornual pregnancy as an ectopic pregnancy

located in the proximal part of the fallopian tube lying within the uterine muscle wall [1–3].

The maternal mortality rate associated with these pregnancies is estimated to be as high as 2.5%, which is 7 times greater than the mortality rate for ectopic pregnancies in general [2,3]. According to the confidential enquiry into Maternal and Child Health report for 2000 to 2002, this is a rare but dangerous condition. In the same report a total of 11 maternal deaths was reported secondary to ruptured ectopic pregnancies; 4 of these were cornual ectopic pregnancies [4]. The factors that predispose to development of a cornual pregnancy are no more different from those related to other ectopic pregnancies. These include pelvic inflammatory disease, tubal surgery, previous ectopic pregnancy, uterine anomalies, tumors, and in vitro fertilization [1,2,5].

With recent diagnostic advances such as high-resolution transvaginal ultrasonography (TVUS) and highly sensitive β -human chorionic gonadotropin (β -hCG) assays, early detection of cornual ectopic pregnancies is possible [2,5,6]. Detection can be as early as 6.8 to 8.8 weeks but

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requires a very high index of clinical suspicion [1,5]. This allows use of conservative medical or minimally invasive surgical options to preserve fertility and to achieve satisfactory outcomes. However, despite these advances, cornual pregnancies remain a diagnostic challenge and are frequently missed [7]. In a series by Soriano et al [5], preoperative diagnosis was present in only 56% of the reported 27 patients.

Current Practice

Most cornual ectopic pregnancies are treated either conservatively with expectant management or medical management using techniques that involve methotrexate or uterine artery embolization [8–10]. Medical management, although relatively noninvasive, is not without side effects and can put the patients at risk of requiring secondary surgical treatment [2,11]. Surgical treatment is also not without consequence. The more traditional approach has been surgical management with exploratory laparotomy ending in either cornual resection or hysterectomy [12]. This can be complicated by catastrophic hemorrhage, resulting in significant patient morbidity and mortality. However, in recent years minimally invasive laparoscopic and hysteroscopy techniques have been used with desirable outcomes (Table 1).

Laparoscopy offers several advantages over laparotomy, such as significantly reduced blood loss, reduced hospital stay, and quick recovery [11]. However, laparoscopy requires clinical expertise and good laparoscopic techniques. Therefore, the results can be operator dependent, and one could question both the efficacy of variable techniques and practical aspects of laparoscopic management. Nonetheless, the laparoscopic approach continues to be safe and effective if adequate technical skills are applied [29].

One of the key technical skills required for laparoscopic treatment of a cornual ectopic pregnancy is the need to achieve hemostatic control with minimal tissue trauma. A review of the literature shows that different authors have reported variable hemostatic techniques (Table 2). Some of these reported techniques have been used individually, whereas others have been used in combination to achieve hemostatic control. One could argue the pros and cons of each technique based on the individual mechanism of action, but in the absence of an agreed guideline or robust evidence, it is

difficult to ascertain the true utility of these techniques. This view is further confounded by the scarcity of long-term data in relation to safety and fertility. Therefore, it is difficult to recommend one technique over another.

However, despite the lack of robust evidence, the use of these techniques allows a way to achieve hemostatic control with resultant reduced blood loss and patient morbidity. We describe a new technique that can be used to achieve such outcomes.

Case Summaries

We discuss 2 cases of cornual ectopic pregnancy treated laparoscopically at Birmingham Women’s Hospital using the double-impact devascularization (DID) technique. Approval from the institutional review board was not undertaken because the surgical technique is a modification of existing hemostatic techniques and was not part of a clinical trial. However, patient consent was undertaken before reporting.

In November 2012 a 30-year-old woman was referred by her general practitioner to the early pregnancy assessment unit. This was her eighth pregnancy. She previously had 3 normal deliveries and 4 miscarriages. It was estimated that she was approximately 8 weeks pregnant. On clinical assessment she was hemodynamically stable with symptoms of mild abdominal pain and vaginal bleeding. On investigation the urine pregnancy test was positive. A high-resolution TVUS and a sensitive β-hCG assay were undertaken. The TVUS showed evidence of a small echo-lucent area in the right ovary measuring 4.6 × 3.7 mm, which was thought to represent a possible ectopic pregnancy. The endometrium was thickened at 5.8 mm with a normal-looking left ovary. There was also some free fluid in the pouch of Douglas. The β-hCG was recorded at 3890 mIU/mL, and the hemoglobin was 12 g/dL. Based on the initial assessment, a diagnosis of ectopic pregnancy was made. As per the departmental protocol a conservative approach was offered in the form of methotrexate treatment. However, because her liver function tests were found to be abnormal on testing secondary to recent antibiotic treatment, methotrexate could not be prescribed. Therefore, alternative surgical treatment with laparoscopic salpingectomy was offered. At this point it was not known that the ectopic pregnancy was in fact cornual. This was discovered at the time of laparoscopy, and the author used the DID technique to assist excision.

Table 1

Surgical approach to cornual ectopic pregnancy

Laparotomy

- Hysterectomy [12]
- Cornual resection [12]

Laparoscopic approach

- Cornual wedge resection [12–14]
- Cornual resection/excision [13–19]
- Cornuostomy/salpingotomy [20–24]
- Mincornual excision [25]

Hysteroscopic approach

- Endometrial resection with laparoscopy [26–28]
- Cornual evacuation with laparoscopy/ultrasound [26–28]

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