Surgical Management Algorithm for Caesarean Scar Pregnancy

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Abstract

Objectives: To report our experience with the management of Caesarean scar pregnancy (CSP) in the first trimester and to develop a unique treatment algorithm allowing physicians to customize their management based on clinical patient characteristics.

Methods: A retrospective review of 12 patients diagnosed with CSP between December 2012 and June 2016 was conducted in a tertiary care hospital in Toronto. All patients were diagnosed with CSP by transvaginal ultrasound using radiologic criteria. Patients were initially treated with an ultrasound-guided embryocidal injection when fetal heart activity was present. Next, patients underwent medical management with systemic multidose methotrexate (MTX) or surgical management using a laparoscopic or transcervical approach depending on CSP characteristics.

Results: The mean age at diagnosis was 35.6 years. The median number of previous CSs was one. The mean serum human chorionic gonadotropin level was 59 938 IU/L. The mean GA at presentation was 8+1 weeks. Two-thirds of patients received medical management with systemic multidose methotrexate. Of these, 50% required additional surgical treatment for the resolution of their CSP. One-third of patients underwent primary surgical treatment, resulting in complete resolution of CSP with no complications. Given the improved outcomes of surgical management in our series, we suggest a treatment algorithm that tailors the surgical approach, either laparoscopic or transcervical, to the characteristics of the CSP.

Conclusion: This constitutes the largest case series of CSP in Canada. Based on our results, CSP can be safely and effectively managed using the suggested surgical algorithm, which accounts for individual patient characteristics.

Résumé

Objectifs : Rendre compte de notre expérience entourant la prise en charge des grossesses sur cicatrice de césarienne au premier trimestre et concevoir un algorithme unique de traitement qui permettrait aux médecins d'adapter leur prise en charge aux caractéristiques cliniques des patientes.

Méthodologie : Nous avons mené une étude rétrospective portant sur 12 patientes ayant reçu un diagnostic de grossesse sur cicatrice de césarienne entre décembre 2012 et juin 2016 dans un hôpital de soins tertiaires de Toronto. Tous les diagnostics reposaient sur des critères radiologiques observés à l'échographie transvaginale. En présence d'activité cardiaque fœtale, les patientes commençaient par subir une injection embryocide guidée par échographie. Ensuite, elles faisaient l'objet d'une prise en charge soit médicale (administration systémique de plusieurs doses de méthotrexate), soit chirurgicale (approche laparoscopique ou transcervicale, selon les caractéristiques du cas).

Résultats : L'âge moyen au diagnostic était de 35,6 ans, et le nombre médian de césariennes antérieures était de un. Le taux sérique moyen de gonadotrophine chorionique humaine était de 59 938 UI/l, et l'âge gestationnel moyen, de 8 semaines et 1 jour. Les deux tiers des patientes ont été prises en charge médicalement (administration systémique de plusieurs doses de méthotrexate), dont 50 % ont ensuite eu besoin d'une intervention chirurgicale. Le tiers des patientes a subi une chirurgie dès le départ; l'intervention a entraîné la résolution complète de ces cas, sans complication. Compte tenu des résultats supérieurs associés à la prise en charge chirurgicale dans notre étude, nous suggérons un algorithme de traitement qui déterminerait la meilleure approche chirurgicale – laparoscopique ou transcervicale – en fonction des caractéristiques du cas.

Conclusion : Il s'agissait de la plus importante étude de série de cas à aborder les grossesses sur cicatrice de césarienne au Canada. D'après nos résultats, l'algorithme proposé, qui tient compte des caractéristiques propres aux patientes, permettrait la prise en charge sécuritaire et efficace de ce problème.

Key Words: Caesarean scar pregnancy, type 1 Caesarean scar pregnancy, type 2 Caesarean scar pregnancy, surgical management, algorithm

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INTRODUCTION

Gynaecologists are witnessing an unparalleled number of complications resulting from the increasing incidence of CSs worldwide.[1,2] Uterine rupture and abnormal placentation are common life threatening complications of CSs.[1] More recently, there has been a surge in Caesarean

scar pregnancy, a rare but equally disastrous clinical entity.[3] Approximately 1/1800 to 1/2500 women with a previous Caesarean delivery will develop a subsequent CSP, where the gestational sac implants into the previous hysterotomy scar.[4] If unrecognized, CSP can lead to catastrophic bleeding, massive transfusion, and emergency hysterectomy.[5,6]

CSP has only recently been recognized as a potential and infrequent consequence of CS. Accordingly, the recommendations for its management are derived from case reports and case series rather than randomized controlled trials.[1] Most specialists agree that therapeutic termination of pregnancy in the first trimester is necessary,[5] but no clear consensus exists on how best to accomplish this. Various management options, including medical and surgical, have been described in the literature.[6] However, most studies strive to establish the safety and efficacy of a single treatment option, rather than tailoring management based on CSP type.

Our objective was to report our experience with the management of CSP in the first trimester, constituting the largest case series of CSP in Canada to date. Based on these results, we suggest a treatment algorithm that is unique amongst others in its ability to account for clinical patient characteristics.

MATERIALS AND METHODS

We conducted a retrospective study evaluating outcomes of all CSPs presenting to Mount Sinai Hospital, a tertiary care referral centre in Toronto, over a 3.5-year period (December 2012 to June 2016). Research ethics board approval was obtained (REB number 15-0205-C).

We included all patients with CSP diagnosed by transvaginal ultrasound using the following radiologic criteria: pregnancy located in the anterior uterine isthmus, empty cervical canal, empty uterine cavity with no contact with the gestational sac, discontinuity in the anterior myometrium (or absence of myometrium) between the gestational sac and the bladder, and no adnexal masses or pelvic free fluid.[2,7] All sonographic images were carefully reviewed by the treating gynaecologist and radiologist, and ultrasound examinations were repeated by the surgical team as needed. When the diagnosis was still in question, patients underwent MRI assessment to further characterize the pregnancy and clarify its exact location. Once the diagnosis was established, patients were extensively counseled and treatment options were reviewed. In earlier years, primary medical management was standardly used, but as we gained experience and reviewed our outcomes, a trend towards treatment with a primary surgical approach was established. Regardless of management type, whenever fetal heart activity was detected on imaging, patients received an ultrasound-guided, intra-sac injection of an embryocidal agent such KCl or 2% lidocaine.

Medical Management

Prior to undergoing medical treatment, patients were assessed for appropriate candidacy for use of methotrexate. Medical management consisted of a multidose MTX regimen (1 mg/kg intramuscularly on days 1, 3, 5, and 7) with oral leukovorin rescue (0.1 mg/kg on days 2, 4, 6, and 8), as is often used for cervical or interstitial ectopic pregnancies.[8] Beta human chorionic gonadotropin levels were drawn on days 1, 3, 5 and 7, and once the β-hCG decreased by more than 15% from the previous value, treatment was stopped and surveillance begun. During this surveillance phase, β-hCG measurements were drawn on a weekly basis until levels became undetectable. If the β-hCG declined by <15% from the previous value, patients were given an additional dose of MTX, 1 mg/kg intramuscularly. Patients were closely followed in the Early Pregnancy Assessment Clinic where any new symptoms could be reported to a health care professional.

Surgical Management

Figure 1 shows our surgical management algorithm. Surgical treatment was performed 48 hours to 1 week after embryocidal injection was administered. All patients underwent laparoscopic bilateral ligation/clipping of the anterior division of the internal iliac artery in an attempt to mitigate blood loss during the procedure. Next, the vesicouterine peritoneum was incised laterally and the bladder dissected in a caudad direction to expose the lower uterine segment at the level of the previous Caesarean scar. This maneuver allowed the surgeon to determine if the pregnancy extended into the uterus (no LUS bulge) or into the abdomen (LUS bulge). When the direction of growth was determined as into the uterine cavity, or no LUS bulge (type 1 CSP),[9] a transcervical approach was selected. In pregnancies that were clearly growing out towards the abdomen (type 2 CSP),[9] the procedure was pursued laparoscopically. Figures 2 and 3 highlight the difference

ABBREVIATIONS

β-hCG	beta human chorionic gonadotropin
CSP	Caesarean scar pregnancy
LUS	lower uterine segment
MTX	methotrexate
PRBC	packed red blood cells