SPECIAL COMMUNICATION

The B-Lynch uterine brace suture, and a bit of this and a bit of that...

Mahantesh Karoshi *
Department of Obstetrics and Gynecology, St George’s University Hospital, London, UK

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ABSTRACT
The widespread application of the B-Lynch brace suture to control postpartum hemorrhage has sparked interest in a variety of adjunctive methods, used alone or in combination, to control uterine bleeding. Although the B-Lynch brace suture has been used with good results throughout the world, failures can and do occur in rare instances, especially when the suture is incorrectly placed for use for an inappropriate indication. Four reports of additional methods to control postpartum hemorrhage are published in this issue of IJGO. Three use the B-Lynch brace suture combined with other techniques. The need for additional techniques reminds the reader of the importance of proper suture application for proper indication. Potential reasons for failure of the B-Lynch suture are provided.

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In March 1997, Christopher B-Lynch and colleagues published their first report using the uterine brace suture for conservative management of postpartum hemorrhage (PPH) [1]. The technique is comparable to bimanual uterine compression and was used in 5 women, 2 of whom later had successful pregnancies. This publication changed thinking in the obstetric community in terms of management of PPH not controlled with medications. The procedure was relatively simple, uterine sparing, and did not interfere with uterine blood supply. It was also reproducible all over the world, with more than 2875 procedures successfully performed to date and few reported failures (C. B-Lynch, personal communication, December 2009).

Since the publication of this landmark article, more than 10 variations of uterine compression sutures have appeared: all claim success, and new modifications are still being reported [2–6]. This is good for physicians interested in management of postpartum hemorrhage resistant to medical therapies, but these publications suggest that we can no longer think that one operation will suffice for all causes of bleeding. Thus, the search for additional supportive surgical technique continues, not only for uterine atony, but also for adherent placenta accreta or placenta previa. In addition, the search continues for combinations of techniques that can be used sequentially, especially when the surgeon has placed a B-Lynch suture and bleeding continues.

The present communication introduces 4 articles in the March issue of IJGO that address particular aspects of PPH management and provide evidence that no single operation can effectively treat all causes of PPH [7–10].

Shahin et al. [7] prospectively studied 26 women with sonographically-located anterior low placenta accreta after previous cesarean deliveries. Bilateral uterine artery ligation was performed followed by placement of a B-Lynch suture. Two deaths occurred as a result of disseminated intravascular coagulation in patients who had also undergone internal iliac ligation besides their standard technique of B-Lynch suture and uterine artery ligation. In the remaining 24 surviving patients, 18 became pregnant at the end of one year, 4 chose to use injectable contraceptives, and 2 were being investigated for hyperprolactinemia. This case series demonstrates that combination procedures involving ligation of the uterine arteries do not alter the uterine blood supply in a manner that interferes with fertility in women desiring further pregnancies.

Ying et al. [8] performed a retrospective case control study involving 41 patients with complete placenta previa. Twenty-four had uterine packing (UP) and 17 underwent transverse annular compression suture (TACS). Some patients additionally underwent ligation of uterine arteries before embarking on either UP or TACS, but this number is not supplied. Overall blood loss was significantly higher in the UP group. Two of the 24 UP patients required hysterectomy because of uncontrolled bleeding, while one patient in the TACS group underwent a complex uterine compression suture (details not provided). In practice, multiple compression sutures should be avoided as they can jeopardize uterine blood supply. If one compression suture technique does not work, it may be advantageous to consider other methods such as embolization, or use of recombinant factor VIIa or subtotal hysterectomy. Several case reports describe uterine necrosis following such uterine compression sutures [11–13], whereas, in contrast, the first case of uterine necrosis after a properly applied B-Lynch suture was not reported until 7 years after the operation became widely practiced [14].

Nine patients reported retrospectively by Arduini et al. [9] were not dissimilar to those reported by Shahin et al. [7], in that both...
groups included patients with adherent placenta. However, the Arduini group placed endometrial hemostatic sutures (Affronti sutures) in addition to using a B-Lynch suture and inserted an intrauterine balloon (type of balloon not specified). The Affronti suture is essentially a square suture, limited to the muscular portion of the uterus and not perforating the uterine serosa. According to the authors, the Affronti suture is analogous to the Cho suture [6]. In addition, all patients underwent prophylactic catherization of the descending aorta, even though none of the patients required embolization of either the internal iliac or uterine arteries.

Finally, Senthikes et al. [10] describe a case in which a patient underwent 4 uterine sparing hemostatic procedures: pelvic arterial embolization, stepwise uterine devascularization, hypogastric artery ligation, and B-Lynch brace suture. The patient later achieved a full-term pregnancy, illustrating the point that even if a uterus is deprived of its major blood supply, it can ultimately function normally because of its rich collateral blood supply derived mainly from the ovarian artery superiorly and vaginal artery inferiorly. This case report also reminds the reader that when one procedure does not work to arrest ongoing PPH, clinicians should swiftly consider other alternative options.

1. Comment

The one common procedure described in 3 of these 4 reports is use of the B-Lynch brace suture at some stage in the management of PPH. It worked well in the majority of reported cases, and so far is the only uterine brace suturing technique having undergone rigorous clinical evaluation worldwide. Regardless, it may not be the operation of choice in all instances of hemorrhage, especially in cases of abnormal placenta (placenta previa, accreta or increta). The United Kingdom Obstetric Surveillance System (UKOSS) study [15] published in 2007—the largest prospective population based study of peripartum hysterectomy—documented a high incidence (51%) of abnormal placenta (accreta, increta or percreta) as a cause of surgery. One important and significant finding of this study was that 9% of women (21 of 318 patients) underwent hysterectomy straightaway, with these women having significantly lower transfusion requirements and a tendency toward lower rates of morbidity and further surgery compared with those who received other treatments prior to hysterectomy.

In the UKOSS study, 50 women required hysterectomy following the use of the B-Lynch or other brace sutures before hysterectomy, despite such techniques having yielded high success rates in case series of severe PPH [16] and the fact that only 9 known failures of the B-Lynch technique are reported in a recent publication [17].

The UKOSS study findings provide an important message for readers of IJGO. Simply stated, the findings of Shahin et al. [7], Ying et al. [8], Arduini et al. [9], and Senthikes et al. [10] should be considered and applied to future patients with caution for a number of reasons, not the least of which is the small number of cases in each study group. Although the authors are to be lauded for their willingness to apply new methodologies, such combinations of techniques need more widespread testing with larger numbers of women.

The UKOSS study also raises the important question of why the uterine brace suture failed so frequently. Although detailed answers cannot be provided without individual case review, it is quite possible that, because of the emergency nature of the operation, many operators may not have undergone formal training in the technique, or had not even read the specific directions or had access to a written description when they were called upon to apply the technique in a crucial, life threatening situation. Accordingly, there may have been a tendency to bypass steps or create a different method that actually compromised uterine blood supply. Other potential pitfalls include not following the correct procedural details, such as not putting the patient in the Lloyd Davies position, exteriorizing the uterus, or checking the uterine cavity to make sure it is empty. Of equal importance, if the wrong indication—i.e., for adherent placenta accreta previa—was used, the operator was, in reality, asking for failure because the Brace suture was conceived as a means to apply forces akin to bimanual compression in the face of uterine atony, rather than deal with the problems associated with adherent placenta.

2. Where to go from here?

The articles described can only serve to heighten the reader’s awareness of the gravity of PPH and the need to consider multiple treatment options. Whereas the UKOSS study questioned the high success rate of the uterine brace suture as previously reported [17], earlier the Scottish confidential audit of severe maternal morbidity identified 52 cases where hemostatic brace suturing was used and hysterectomy was avoided in 42 (81%) women [18]. Further, a more recent systematic review of uterine brace sutures by Dounouchtis et al. [19] documented a success rate of 92%. With regard to performing any form of uterine brace suture, selection of right cases at the appropriate time is crucial, as hemostasis should be achieved in the golden hour [20] to avoid additional commonly occurring complications such as disseminated intravascular coagulation. In the absence of large-scale comparative data showing that one form of uterine brace suture is superior to other, the suggestion of the Royal College of Obstetricians and Gynaecologists (RCOG) that: “obstetricians are encouraged to familiarize themselves with one technique” remains valid. Details of the B-Lynch brace suture are available without charge online in “A Textbook of Post-Partum Hemorrhage” (www.sapienspublishing.com) where all 54 chapters are available to download. One of the additional tips suggested by the RCOG is that it is advisable to place a laminated diagram of the technical steps of brace suture in all operating theaters [21].

Other treatment modalities for PPH also have published ranges of success. For example, the quoted success for arterial embolization or ligation of the pelvic arteries varies between 85% [19] and 95% [22]. Combination procedures have a role to play, especially in patients with adherent placenta. However, they should be planned ahead if clues about adherent placenta are present prenatally, such as an anomaly scan in the second trimester showing placental location as anterior and lower segment in a woman with a previous cesarean delivery or deliveries. The obstetrician should also be aware that in resource-poor areas with limited facilities, it may be worthwhile to consider subtotal hysterectomy early on in a parous woman with PPH.

References


