

## **The B-Lynch surgical technique for the control of massive postpartum haemorrhage: an alternative to hysterectomy? Five cases reported.**

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### **Introduction**

The B-Lynch suturing technique (brace suture) may be particularly useful because of its simplicity of application, life saving potential, relative safety, and its capacity for preserving the uterus and thus fertility. Satisfactory haemostasis can be assessed immediately after application. If it fails, other more radical surgical methods as mentioned in this paper and in the literature can be considered. The special advantage of this innovative technique is an alternative to major surgical procedures to control pelvic arterial pulse pressure or hysterectomy. This suturing technique has been successfully applied with no problems to date and no apparent complications.

Postpartum haemorrhage is a serious obstetric problem. Life threatening postpartum haemorrhage can be a nightmare. Current clinical methods are unsuitable for the objective assessment of postpartum haemorrhage, and each patient's ability to compensate varies considerably. There are no reliable data on the true incidence of severe life threatening postpartum haemorrhage. The morbidity and mortality rise not only with delay in diagnosis and treatment but also in accordance with any increase in caesarean section rate. Available methods to control postpartum haemorrhage depend on the cause but in general delaying diagnosis and treatment may lead to a life threatening situation. Five percent of vaginal deliveries may lead to postpartum haemorrhage with a blood loss > 1 L3. The common causes include uterine atony, lower genital tract lacerations, retained placenta and placental fragments, coagulopathy, uterine inversion and ruptured uterus 9 These causes can individually or collectively lead to life threatening situations.

Published data suggest a variety of acceptable methods of treatment such as simple bi-manual compression, ecbolics such as oxytocins, syntometrine and prostaglandins which are safe and effective but occasionally prove inadequate or unsatisfactory. Surgical methods vary depending on the site of bleeding, the severity of the condition and the cardiovascular stability of the patient. Various surgical methods to reduce pelvic pulse pressure have been described, from simple surgical ligature of the uterine artery to more complicated uterine, ovarian and internal iliac artery ligature 3 7. These procedures need skill which may not normally be possessed by the duty Registrar faced with such problems in the middle of the night. Probably some Consultants have never done such complicated procedures because of the relative rarity of this emergency obstetric problem.

We describe an innovative method which is simple and effective, tried and tested with a successful outcome for the control of life threatening postpartum haemorrhage, as an alternative to more complicated surgery including hysterectomy.

### **Description Of Technique**

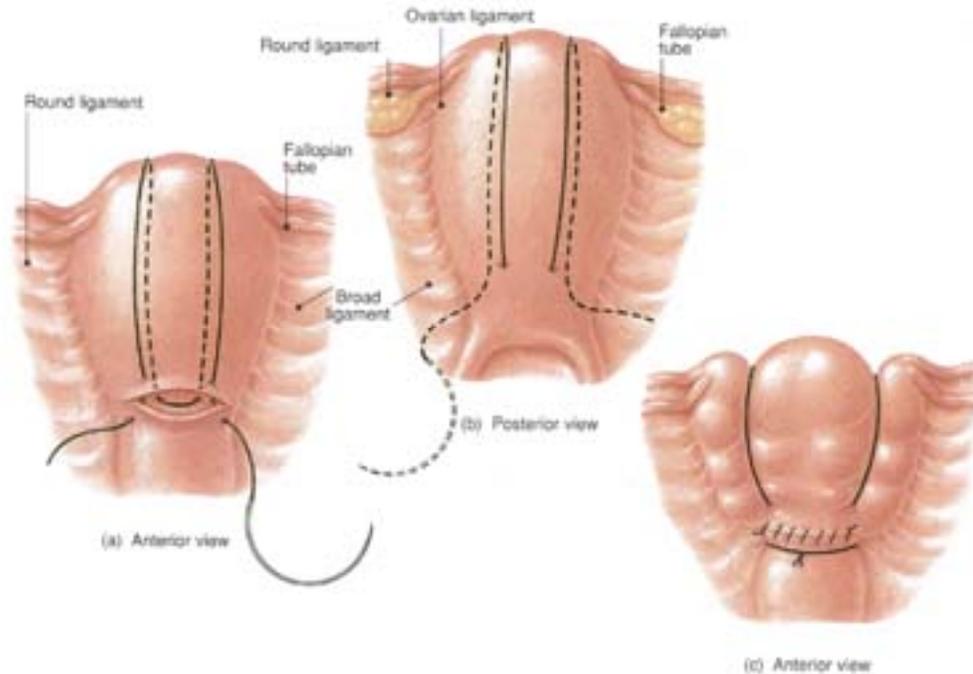
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### **Description of technique**

The following steps are involved in the competent application of the B-Lynch suturing technique:

1. The patient under general anaesthesia is catheterised and placed in the Lloyd Davies position for access to the vagina to assess the control of bleeding objectively by swabbing.
2. The abdomen is opened by an appropriate sized Pfannenstiel incision or if the patient has had caesarean section following which she bled, the same incision is re-opened.
3. On entering the abdomen either a lower segment incision is made after dissecting off the bladder or sutures of a recent caesarean section are removed and the cavity entered. The uterine cavity is evacuated, examined and swabbed out.
4. The uterus is exteriorised and rechecked to identify any bleeding point, if the bleeding is diffuse such as in cases of uterine atony or coagulopathy, profuse placenta bed bleeding placenta accreta or inertia where no obvious bleeding point is observed then bi-manual compression is first tried to assess the potential chance of success of the B-Lynch, suturing technique. The vagina is swabbed out to confirm adequate control of bleeding.
5. If vaginal bleeding is controlled, for a left handed surgeon or the surgeon electing to stand on the left side of the patient, the procedure is as follows :

1. A 70 mm round bodied hand needle on which a No. 2 chromic catgut suture is mounted is used to puncture the uterus 3 cm from the right lower edge of the uterine incision and 3 cm from the right lateral border.
2. The mounted No. 2 chromic catgut is threaded through the uterine cavity to emerge at the upper incision margin 3 cm above and approximately 4 cm from the lateral border (because the uterus widens from below upwards).
3. The chromic catgut now visible is passed over to compress the uterine fundus approximately 3 - 4 cm from the right cornual border.
4. The catgut is fed posteriorly and vertically to enter the posterior wall of the uterine cavity at the same level as the upper anterior entry point.
5. The chromic catgut is pulled under moderate tension assisted by manual compression exerted by the first assistant. The length of the catgut is passed back posteriorly through the same surface marking as for the right side the suture lying horizontally.
6. The catgut is fed through posteriorly and vertically over the fundus to lie anteriorly and vertically compressing the fundus on the left side as occurred on the right. The needle is passed in the same fashion on the left side through the uterine cavity and out approximately 3 cm anteriorly and below the lower incision margin on the left side.
6. The two lengths of catgut are pulled taught assisted by bi-manual compression to minimise trauma and to achieve or aid compression. During such compression the vagina is checked that the bleeding is controlled.
7. As good haemostasis is secured and whilst the uterus is compressed by an experienced assistant the principal surgeon throws a knot (double throw) followed by two or three further throws to secure tension.
8. The lower transverse uterine incision is now closed in the normal way, in two layers, with or without closure of the lower uterine segment peritoneum.
9. For a major placenta praevia we suggest that an independent figure of eight suture is placed at the beginning anteriorly or posteriorly or both prior to the application of the B-Lynch suturing technique as described above if necessary.



Parts (a) and (b) demonstrate the anterior and posterior views of the uterus showing the application of the B-Lynch Brace suture, Part(c) shows the anatomical appearance after competent application.

## Discussion

Of the three great messengers of death in maternity, haemorrhage might play the most important and dramatic role. Massive postpartum haemorrhage is an important cause of maternal mortality <sup>1,2,9</sup>. The number of direct maternal deaths from haemorrhage from 1988 to 1990 has more than doubled, compared with the period 1985 to 1987. Of the 277 deaths occurring during the period 1988 to 1990, during pregnancy or before 42 days postpartum, 22 were due to postpartum haemorrhage (PPH) <sup>2,10</sup>. In the 1991–1993 report 15 deaths were recorded <sup>9</sup>. In most cases of massive PPH, after ecbolics have been used and correctable causes excluded, hysterectomy or ligation of the internal iliac vessel is recommended and usually carried out <sup>3,7</sup>. There are a number of arguments against uterine tamponade in the management of postpartum haemorrhage <sup>6</sup>.

Hypogastric artery ligation (internal iliac division) does have a specific role in the management of obstetric haemorrhage, but it is not without substantial risk of failure <sup>7</sup>. It is obviously not a definitive procedure regardless of causative factors and in patients who are not haemodynamically stable hysterectomy may be the procedure of choice.

The B-Lynch suturing technique has been successfully used in all the described cases from 1989 to 1995 by the first author. This procedure has been successful so far in all patients managed by this novel technique. The 'brace' or compression suturing effect allows conservation of the uterus and fertility as evidenced by subsequent deliveries described in Cases 1 and 2. Both had normal pregnancies. One had spontaneous vertex delivery. The other elected for lower segment caesarean section without trial of labour and the examination of the uterus after caesarean section showed no abnormal features. This B-Lynch suturing technique is simple and easy to apply than other surgical procedures recommended to reduce pelvic arterial pulse pressure. Among those described in the literature are ligation of the ovarian, uterine and internal iliac artery <sup>3</sup>. These techniques are not easy to accomplish where control of such bleeding needs expeditious management. It is important to note that such suturing techniques may not achieve adequate control of bleeding particularly when there is coagulopathy and diffuse bleeding from an atonic uterus and delay in effecting surgical technique may further compromise the patient's critical condition <sup>3</sup>. The B-Lynch suturing technique as demonstrated in these described cases has been effective in the control of massive postpartum haemorrhage. The test of potential efficacy is a simple bi-manual compression after exteriorising

the uterus. The application of the suture itself is far less complicated than either internal iliac artery ligation or hysterectomy. The operating time is probably shorter.

The illustrations (a), (b) and (c) in Fig. 1 demonstrate that the sutures are placed away from the uterine cornua without any major vessel or organ compromise. Figure 1c demonstrates the resultant compression effect. The bladder, ureter, major vessels and intestines were examined on each occasion. The immediate haemostatic result of this technique can be seen before closure of the abdomen if the patient is in the Lloyd Davies position. If this fails one can still resort to more invasive procedures but this has not been necessary in our series. The operation therefore should be considered a procedure of choice if medicals do not control PPH and certainly before any radical surgery is considered. A more user friendly prototype suture and needle with blunted tip exerting a less constricting effect but with effective haemostatic potential is being developed.

## **Conclusion**

The invention of the B-Lynch brace suturing technique has proved invaluable in the control of massive postpartum haemorrhage as an alternative to hysterectomy. The five patients reported in this series evidence the effectiveness of this technique in such life threatening situations. The case summaries describe the critical conditions that prevailed and the gratifying outcome. The cost effectiveness of this procedure may encourage developing countries to consider its application where necessary both for prophylactic and therapeutic purposes