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Short Communication

Uterine haemostatic packing tape: a novel indigenous method for rapid point-of-care preparation

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ABSTRACT

Controlling obstetric haemorrhage has remained a major clinical challenge and continues to drive innovations and the sharing of effective techniques. Packing of the uterine cavity and other bleeding cavities is sometimes the only feasible temporary or definitive intervention when uterine-conserving procedures, specialised equipment, or surgical expertise are unavailable. This technique has been practiced for decades. Conventionally, the packing material consists of a tape prepared by rolling surgical gauze into a narrow strip. Although chitosan-based haemostatic packs are available, they are expensive, not readily accessible, and often associated with inventory constraints. Furthermore, the width of the packing tape must be tailored to the size of the bleeding cavity and should be wider when packing an atonic uterus with a widely dilated cervix. We developed an indigenous packing tape using a surgical cotton sheet that can be prepared instantly at the point of care. In our obstetric practice, this packing material effectively addressed these limitations and proved to be an efficient option for uterine packing in postpartum haemorrhage (PPH) and for packing other bleeding cavities, which we have described in this communication.

Keywords: Postpartum hemorrhage, Uterine packing, Hemostatic pack

INTRODUCTION

Postpartum haemorrhage (PPH) arising from various bleeding sites often requires management with pressure packing, and the effectiveness of pressure-pack tamponade has been repeatedly demonstrated.¹⁻⁷ The World Health Organization (WHO) Guideline Development Group (GDG) recognizes uterine packing as a useful temporizing measure when medical treatment has failed and no other interventions for the management of PPH are available.⁸ The uterine balloon tamponade is often compared with uterine packing even in recent studies.⁹

Conventionally, uterine packing is performed using surgical gauze rolled into a tape. However, this material has several limitations. Owing to its loose weave (warp and weft), surgical gauze rapidly becomes saturated with

blood, making it difficult to handle. Once soaked, it loses volume, exerts less pressure on the bleeding surface, and provides suboptimal tamponade. In addition, the quantity of sterile gauze required (typically three to six rolls knotted end-to-end) may not always be readily available. Although chitosan-based haemostatic packs are commercially available, they are expensive, not universally accessible, and present inventory-related challenges.

The required width of the packing material also varies according to the clinical situation. A wider pack is needed for an atonic uterus with a fully dilated cervix following vaginal delivery, whereas a narrower pack is more suitable after some caesarean sections in which the cervix is not fully dilated. Similarly, drainage of large paravaginal haematomas through a vaginal incision requires a narrow packing strip. The literature describes cavity packs

prepared from roller gauze, abdominal pads, and commercially available chitosan-impregnated haemostatic packs.²⁻⁴ However, in resource-limited settings, the availability of packing material in adequate quantity and appropriate dimensions may be a significant challenge.

To address these limitations, we developed an indigenous packing material, which we refer to as the 'Jugaad pack'. The term *Jugaad*, officially included in the Oxford English Dictionary in 2017, refers to an innovative and flexible approach to problem-solving using limited resources.

In this article, we describe a simple technique for preparing a cavity-packing material instantly on the surgical trolley using materials routinely available in the operating theatre. The packing material can be prepared within minutes, requires no additional equipment, is inexpensive, and is consistently available under sterile conditions. The technique is based on the principle of creating a continuous strip from a surgical cotton sheet, similar to paper-cutting methods used in craft activities. Figure 1 illustrates the steps involved in preparing the packing tape. We successfully used this indigenous packing material for uterine atony, vaginal lacerations, and other obstetric bleeding cavities requiring tamponade.

METHODS

Based on our clinical experience over several years, we developed an indigenous packing material that is consistently available, can be prepared in sufficient quantity, and can be tailored instantly to the required width and length.

In many countries, reusable cotton surgical drapes are preferred over disposable surgical sheets because of their cost-effectiveness and reduced environmental impact. Consequently, reusable cotton surgical sheets are routinely available in operating theatres. At our centre, surgical sheets measuring 92 cm × 87 cm are used for draping. The proposed packing tape is prepared instantly from these surgical sheets.

In addition to its ready availability, this packing material offers several practical advantages. Owing to its higher fabric density, it sheds minimal lint, has good absorbent capacity, and retains its structural integrity better than conventional gauze after becoming blood-soaked. A surgical cotton sheet is cut into a continuous ribbon (packing tape) of the desired width and length and then rolled into a cylindrical pack.

Figure 1 illustrates the technique for cutting the surgical sheet into a packing tape. The width of the tape is determined by the size of the opening through which it must be introduced to achieve adequate packing of the bleeding cavity. For uterine atony following vaginal birth, where the cervical canal is widely dilated, a tape width of 6-8 cm is generally appropriate.

Figure 1 (Pattern for cutting surgical sheet into haemostatic packing tape and its dimensions after rolling) also illustrates dimensions of rolled packing tape prepared from a 92×87 cm surgical sheet. When rolled, the width of the tape forms the height of the cylinder, whereas length of tape determines its diameter. These dimensions vary according to width of tape and size of surgical sheet used.

In the illustrated example, a tape prepared from a 92 cm × 87 cm surgical sheet was rolled into a cylinder measuring 5 cm in height and 10 cm in diameter, resulting in a volume of approximately 392.5 cm³ ($V = \pi d^2 h / 4$, where V is the volume, d is the diameter, and h is the height). Although the exact volume of the uterine cavity during atonic PPH has not been established, studies evaluating intrauterine balloon tamponade volume and intraluminal pressure suggest an average uterine cavity volume of approximately 387 mL (range: 300–500 mL).¹⁰ This observation indicates that a single surgical sheet is generally sufficient to pack an atonic uterus. If additional packing is required, the tape from a second surgical sheet can be securely tied to the end of the first. The tape width should also allow easy removal after haemostasis has been achieved. The surgical team should include the packing sheet in the standard surgical swab and instrument count.

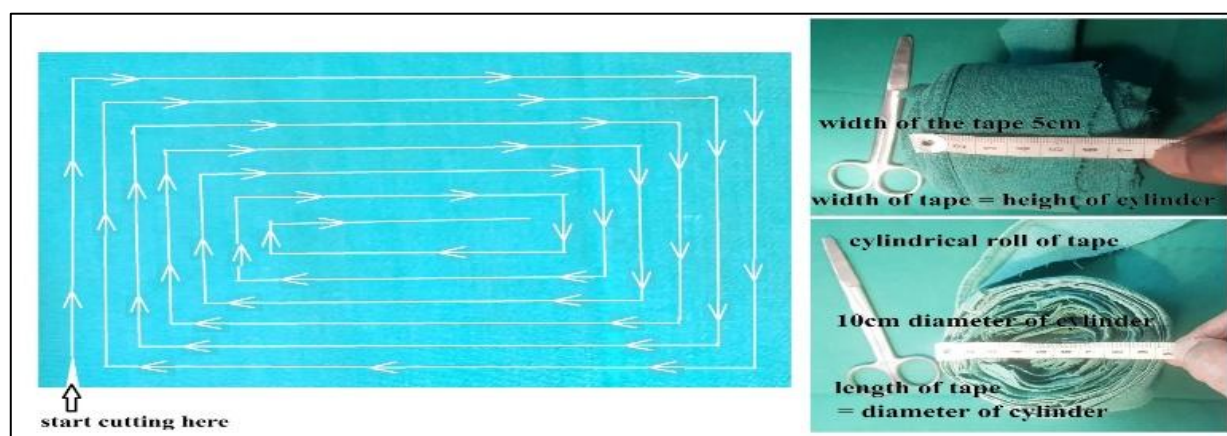


Figure 1: The pattern for cutting the surgical sheet into a packing tape for hemostasis, its measurements when rolled.

This report is based on the authors' collective clinical experience over the past 3 years. The technique has also been used for many years at the authors' affiliated institutions and at other centres when assistance was sought for the management of intractable obstetric haemorrhage.

Our experience with preparing a tailor-made packing tape during surgical procedures demonstrated that it was useful for packing various bleeding cavities encountered in obstetrics and gynaecology. The technique offers the advantages of being readily available, inexpensive, and easily customized to the width required for the specific

clinical situation. Although developed for obstetric and gynaecological applications, the same principle may also be applicable to other surgical specialties requiring cavity packing for haemostasis.

We recommend practice drills using paper or discarded cloth to familiarize surgical teams with the technique before its clinical use.

RESULTS

Table 1 shows 14 cases with its situations where it was used in the last three years.

Table 1: PPH cases with its situations in the last three years.

Situation	No. of cases	Average duration of pack retention (hours)	Results
PPH, post vaginal birth	5	14	Successfully managed.
PPH, post vaginal birth	2	Not known, as used as temporizing method.	Patient transferred to other hospital in a city.
PPH, failed uterine balloon tamponade because of expulsion	2	14	Successfully managed.
Paravaginal hematomas, packing after incision and drainage	5	12	Successfully managed.

DISCUSSION

Uterine packing has often been regarded as an outdated and controversial method for the management of PPH. Over time, it has largely been replaced by other tamponade techniques, particularly commercially available and indigenous uterine balloon tamponade devices. Nevertheless, uterine packing continues to have a role in settings where alternative tamponade methods, surgical expertise, or appropriate equipment are unavailable.¹¹ Some authors have even compared uterine packing equivalent to the balloon tamponade for uterine atony, placental previa bed bleeding and coagulopathy following spontaneous delivery and caesarean sections.⁴ It may serve as both a temporizing measure and a definitive method for achieving haemostasis in selected cases like balloon displacement.¹¹⁻¹³

In this article, we described our experience with an indigenous packing material that can be prepared rapidly from a reusable surgical cotton sheet routinely available in operating theatres. The proposed technique provides a simple, inexpensive, and readily accessible alternative to conventional packing materials. Its dimensions can be customized according to the size and location of the bleeding cavity, making it suitable for a variety of obstetric and gynaecological situations. We believe that this technique may be particularly valuable in low-resource settings, where access to commercial haemostatic materials may be limited. To facilitate safe clinical application, we recommend that healthcare providers practice the technique using paper or discarded cloth before incorporating it into routine clinical practice.

Limitations

The present report describes our clinical experience with this technique and is based on observational use rather than a comparative study. As uterine packing is now generally reserved for selected situations in which other conservative measures are unavailable, have failed, or are not feasible, prospective comparative studies with conventional uterine packing materials or balloon tamponade devices are difficult to conduct and may not be ethically or practically feasible.

Consequently, the effectiveness and safety of this technique relative to other uterine tamponade methods could not be formally evaluated.

CONCLUSION

We view uterine packing a valid option for managing PPH in some cases, especially where other methods are not available for reasons of resource or skill. It should also be seen as an essential temporizing method to manage PPH. The proposed method requires no specialized resources or advanced clinical skills. Constructed entirely from standard materials available in any obstetric unit, it eliminates the need for advance preparation or dedicated inventory management. We recommend practice drills on paper or waste cloth.

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