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Research Article

Cost cutting: laparoscopic extraperetoneal and retroperitoneal approach – economical way

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ABSTRACT

Background: Extraperitoneal and retroperitoneal approaches have become popular among laparoscopic surgeons. The limited space makes the dissection more difficult. Although experienced surgeons create this initial working space under vision, the beginners find it easy to do so by using balloon dissectors (BDs). But the cost of disposable items is one of the limiting factors in the popularity of these operations. Therefore, indigenously designed BDs are popular. By using a homemade balloon, non-disposable ports and non tackering the mesh we have been able to reduce the cost considerably, and were able to create large working spaces with good hemostasis without any complications and conversion to open. We would like to present our technique of making the balloon.
Methods: Between January 2014 and September 2015, consecutive 50 cases of totally extra-peritoneal repair (TEP) and 20 cases of laparoscopic retroperitoneal pyelolithotomy (LRPL) were done using a homemade balloon for creating the extra peritoneal and retroperitoneal spaces respectively.
Results: We succeeded in creating the extraperitoneal space in all patients with the help of this balloon without any complications and conversion to open. There was no leak and bursting of the balloon.
Conclusions: It is cheap, strong, sterile and readily available material for making the balloon for creating the extra peritoneal and retroperitoneal spaces respectively in the laparoscopic surgeries.

Keywords: Balloon dissectors, Totally extra-peritoneal repair, Inguinal hernias, LRPL

INTRODUCTION

In recent years, the extraperitoneal and retroperitoneal approach has become popular among laparoscopic surgeons for the treatment of extraperitoneal and retroperitoneal pathologies. In both these approaches, the anatomical landmarks are less prominent compared with the transperitoneal approach, the fatty area and limited space makes the dissection more difficult. Although experienced surgeons create this initial working space under vision, the beginners find it easy to do so by using balloon dissectors (BDs). The creation of space with the help of balloon is helpful in the learning curve of extraperitoneal and retroperitoneal surgeries. But the cost of disposable items is one of the limiting factors in the popularity of these operations. Therefore, indigenously designed BDs are popular.[1,2] The balloon dilatation technique was first described by Gaur in 1992 and has become popular all over the world.[1] Special balloon dilators, Foley catheters, condoms, Helmstein balloons and glove fingers are being used for this purpose.[3-5] The simplest indigenously designed BD, assembled by tying 'glove-fingers' over a 10F red-rubber catheter, is difficult to insert as the catheter kinks.[1] By using a homemade balloon, non-disposable ports and non tackering the mesh we have been able to reduce the cost considerably and could make these surgeries affordable for the poor population at a district level hospital. We would like to present our technique of making the balloon.

In this study, we used the balloon made from the 'inner transparent sterile cover of the suction tube'. The 'inner sterile cover of the suction tube' was tied on an 11 mm port cannula by doubly tying with no 1 silk suture in a watertight and airtight fashion. The author is very satisfied using this balloon device when performing TEP and LRPL.

METHODS

Between January 2014 and September 2015, consecutive 50 cases of totally extra-peritoneal repair (TEP) and 20 cases of laparoscopic retroperitoneal pyelolithotomy (LRPL) were done using a homemade balloon for creating the extraperitoneal and retroperitoneal spaces respectively. The 'inner transparent sterile cover of the suction tube' was cut and fixed on a 11 mm port cannula by doubly tying with no 1 silk suture 12 cm from its tip in a watertight and airtight fashion as shown (Figure 1A). This created a balloon on the shaft of the port cannula 12 cm long and 10 cm wide on inflation (Figure 1B, C). The balloon was tested with air insufflations before introduction. We found the inner sterile cover of the suction tube is a strong material and were able to hold 1000 cc air without bursting and leaking. After finger dissection it was easy to advance the balloon on the cannula in the extraperitoneal/retroperitoneal spaces. The 11 mm port cannula has smooth tip, which is a traumatic when introduced in the space and also does not puncture the material of sterile cover. It has a one-way valve at the other end and does not allow air to leak (Figure 1D). Moreover we could put 10 mm telescope in the transparent balloon through 11 mm port cannula and inflate the balloon under vision to witness the creation of bloodless space (Figure 2A).

RESULTS

Table 1: Extraperitoneal and retroperitoneal procedures.

Procedures	Mean Op. time (min.)	No. of Patients
TEP	45	50
Ureterolithotomy	90	10
Pyelolithotomy	120	8
Pyeloplasty	150	2

Table 2: Balloon distension needed for extraperitoneal and retroperitoneal procedures.

Procedures	Balloon distension (ml)
TEP	700-1000
Ureterolithotomy	700-900
Pyelolithotomy	800-1000
Pyeloplasty	800-1200

We were able to create large working extraperitoneal and retroperitoneal spaces and hemostasis in all patients with the help of this balloon tamponade. The average operative time for the various procedures is shown in Table 1. The shortest was 45 min (for a TEP) and the longest 160 min (for a pyeloplasty). The average distension (ml) needed for most of the cases was 700-1000ml (Table 2).

Table 3: Complications of extraperitoneal and retroperitoneal space creations.

Complications	No. of Patients
Peritoneal Tear	3
Surgical Emphysema	2
Primary Haemorrhage	2
Secondary Haemorrhage	1
Paralytic Ileus	2
Total	10

Figure 1: The material required for the preparation of balloon.

Figure 1A: The inner transparent sterile cover of the suction tube was cut and fixed on a 11 mm port cannula by doubly tying with no 1 silk suture 12 cm from its tip.

Figure 1B: Balloon on the shaft of the port cannula 12 cm long on inflation.

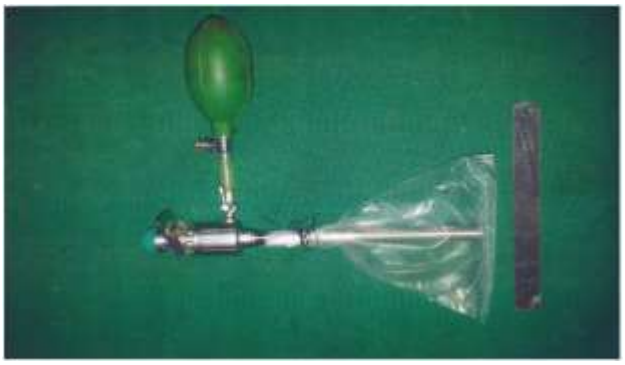

Figure 1C: Balloon on the shaft of the port cannula 10 cm wide on inflation.

Figure 1D: One-way valve at the other end and does not allow air to leak.

Figure 2A: Inflating balloon under vision to witness the creation of bloodless space.

The failures (Table 3) were during the early part of the learning curve owing to bleeding and peritoneal tears. There was no conversion into an open. There were no major complications and the minor complication rate was 14% (Table III). The peritoneum was torn during initial extraperitoneal and retroperitoneal dissection, during balloon inflation or during laparoscopic dissection. It was suspected when the extraperitoneal and retroperitoneal space did not open up in spite of increasing the insufflation pressure to 30 mmHg and was confirmed by the presence of abdominal distension. A minor degree of surgical emphysema around the balloon port was noted in most patients undergoing major procedures. It was of no consequence and disappeared within 4 h. There was bleeding during pyelolithotomy and pyeloplasty in two patients which was well control. Two patients had gross haematuria after pyelolithotomy which subsided in 4 to 6 days. There was mild paralytic ileus in two patients. This subsided in 2-3 days.

DISCUSSION

With increasing experience in the technique the extraperitoneal and retroperitoneal spaces can be created without the use of balloon but it is helpful to use balloon in the learning curve and has been shown to reduce the conversion rate.[6,7] To make it cost-effective several modifications of locally made balloons using surgical gloves etc. have been tried successfully.[1,2] In our balloon, the port cannula is helpful in introducing, positioning and inflating the balloon in the appropriate area. It is cheap, strong, sterile and readily available material for making the balloon and creating large working extraperitoneal and retroperitoneal spaces. It provides good hemostasis without any complications, conversion, leak and bursting of balloon. One can also witness the inflation of balloon under vision.

CONCLUSION

It is cheap, strong, sterile and readily available material for making the balloon for creating the extraperitoneal and retroperitoneal spaces respectively in the laparoscopic surgeries.

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REFERENCES

1. Gaur DD. Laparoscopic operative retroperitnoeoscopy: Use of a new device. J Urol. 1992;148:1137-9.
2. Chowbey PK, Khullar R, Sharma A, Soni V, Baijal M. Totally extraperitoneal repair of inguinal hernia: Sir Ganga Ram Hospital technique. J Min Access Surg. 2005;2:160-4.
3. Gaur DD, Agarwal DK, Purohit KC, Darshane AS. Laparoscopic condom dissection: new technique of retroperitoneoscopy. J Endourol. 1994;8:149-51.
4. Ono Y, Katoh N, Kinukawa T, Sahashi M, Ohshima S. Laparoscopic nephrectomy, radical nephrectomy and adrenalectomy: Nagoya experience. J Urol. 1994;152:1962-6.
5. Gaur DD. A simple device for making a glove balloon for retroperitoneal dissection. Minim Invasive Ther Allied Technol. 2003;12:65-8.
6. Chiang DT, Bohmer R. Cutting the cost: Laparoscopic inguinal hernia repair by totally

extraperitoneal approach without disposable instruments. Surg Pract. 2006;4:154-8.
7. Bringman S, Ek A, Haglind E, Heikkinen T, Kald A, Kylberg F, et al. Is a dissection balloon beneficial in totally extraperitoneal endoscopic hernioplasty (TEP)? A randomized prospective multicenter study. Surg Endosc. 2001;15:266-70.

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