

Inguinal hernia repair with tension-free hernioplasty under local anesthesia

Jia-Sen Gao, MD, Zhen-Jun Wang, MD, Bo Zhao, MD, Song-Zhang Ma, MB, Guo-Yi Pang, MB, Dong-Ming Na, MB, Yu-Dong Zhang, MB.

ABSTRACT

الأهداف: لتقييم استخدام التخدير الموضعي في عملية تقويم الفتق الخالية من التوتر.

الطريقة: أجريت هذه الدراسة بمستشفى بيجنغ تشاويانغ التابع للجامعة الطبية - بيجنغ - الصين، خلال الفترة مابين يناير 2007م وحتى مايو 2008م. تم إدراج جميع المرضى وعددهم 110 مريضا، الذين خضعوا لعملية جراحية تم فيها إصلاح الفتق المغبني باستخدام شبكة تحت التخدير العام في هذه الدراسة. لزيادة التجانس والتماثل للعينات، قمنا باستبعاد إصلاحات الفتق السري، إصلاحات الفتق السدوي، العمليات الغير اختيارية، العمليات التي لا يوجد فيها استعمال شبكة والإصلاحات التي أجريت بطرق جراحية أخرى. قمنا باستعادة ومراجعة بيانات 110 مريضا.

النتائج: بلغ متوسط وقت العملية 45 دقيقة (30-70 دقيقة). بلغت متوسط فترة البقاء في المستشفى 3-4 أيام. لم يكن هنالك نسبة وفيات بعد العملية الجراحية في هذه الدراسة. ولم يظهر وجود التهاب في موضع الجراحة. عانى مريضين (18%) من ورم دموي صفني متوسط، وشفيا بعد اعطائهما العلاج الحاقن المستخرج. بلغت فترة ألم الشقوق 2-3 أيام، لم يحتاج أيا من المرضى مسكنات بعد العملية الجراحية، خلال المتابعة أو معاودة لظهور المرض.

خاتمة: يعتبر استعمال التخدير الموضعي في عملية إصلاح الفتق الأربي المغبني بواسطة تقويم الفتق الخالي من التوتر طريقة آمنة وبديلا فعالا لعلاج المرضى المنومين.

Objectives: To evaluate the use of local anesthesia in tension-free hernioplasty in a local hospital.

Methods: The study took place at Beijing Chaoyang Hospital Affiliated to Capital Medical University, Beijing, China during the period from January 2007 to May 2008. All 110 patients who had undergone inguinal hernia repair with mesh under local anesthesia were included in the study. To increase the homogeneity of the sample, we excluded umbilical hernia repairs, parastomal hernia repairs, non-elective procedures, procedures not

involving mesh, and repairs performed concurrently with another surgical procedure. We performed a retrospective review of all 110 patients' data.

Results: The average operating time was 45 minutes (30-70 minutes), and the average hospital stay was 3-4 days. There was no postoperative mortality in this study. No surgical site infection occurred. Two patients (18%) that suffered from a moderate scrotal hematoma had recovered after extract injection therapy was applied. The duration of incisional pain was 2-3 days, and no patient required post-operative analgesia. During the follow-up, no recurrence occurred.

Conclusion: The use of local anesthesia in inguinal hernia repair with tension-free hernioplasty is a safe and effective alternative for inpatient treatment.

Saudi Med J 2009; Vol. 30 (4): 534-536

From the Department of General Surgery, Beijing Chaoyang Hospital, Capital Medical University, Beijing, China.

Received 22nd November 2008. Accepted 24th February 2009.

Address correspondence and reprint request to: Professor Zhen-Jun Wang, Department of General Surgery, Beijing Chaoyang Hospital, Capital Medical University, Beijing 100020, China. Tel. +86 (10) 85231604. Fax. +86 (10) 85231604. E-mail: 08chaoyang@sina.com

Hernioplasty for groin hernia is one of the most common surgical procedures in many countries.¹⁻⁷ The Bassini operation was the optimal choice for over 100 years, but the use of prosthetic material is now established in groin hernioplasty, and the concept of plugging the defect has evolved considerably since 1974.^{8,9} Mesh plug and patch hernioplasty was popularized by Rutkow and Robbins.⁸ The advantages of this method are its simplicity, a tension-free result, and a low recurrence rate.^{5,10-12} The plug protects the internal ring and allows less dissection. The mesh and plug not only overlap the defect, but also cover the entire myopectineal orifice. There are about 700,000

open mesh repairs carried out as day surgery procedure in the United States annually.⁵ In China in 2007, only a little of inguinal hernia mesh repairs were carried out, as day surgery procedure in China must be under local anesthesia. However, most tension-free hernioplasty was with combined spinal and epidural anesthesia (CSEA) in China. The aim of our study was to investigate the effect of local anesthesia in inguinal hernia repair with tension-free hernioplasty.

Methods. This study took place at Beijing Chaoyang Hospital Affiliated to Capital Medical University, Beijing, China during the period from January 2007 to May 2008. All 110 patients who had undergone inguinal hernia repair with mesh under local anesthesia were included in the study. To increase the homogeneity of the sample, we excluded umbilical hernia repairs, parastomal hernia repairs, non-elective procedures, procedures not involving mesh, and repairs performed concurrently with another surgical procedure. All 110 patients signed the informed consent before the operation. These operations were performed by the same surgical group, including 2 attending surgeons and 2 surgical professors. We performed retrospective review of all 110 patients' data. Their recorded clinical, operative, and follow-up details were analyzed retrospectively. For follow-up, we used telephone interview to focus on chronic pain and recurrent hernias. The ethics committee of Beijing Chaoyang Hospital Affiliated to Capital Medical University has approved the study. We used Mesh Plug and Patch (Bard Co., Murray Hill, NJ, USA) as repair material in the study. We applied 1% lidocaine 10 ml hypodermic in the skin incision to block the cutaneous branch of the intercostal nerve. Then, we applied 3 ml of 1% lidocaine in the area next to the spermatic cord to block the reproductive branch of the genitocrural nerve. After the dissection, and locating the iliohypogastric nerve and ilioinguinal nerve, 3 ml of 1% lidocaine was applied to block the proximal part of the iliohypogastric nerve and the ilioinguinal nerve. Thereafter, the area that is between the transversalis fascia and peritoneum at the internal ring was injected with 5 ml of 1% lidocaine to block the genitocrural nerve. In this study, the surgical technique is as follows: the conventional anterior repair incision was made. The incision must be made so that it is slightly above both the deep inguinal ring and the hernia defect. The aponeurosis of the external oblique is transversely incised, separating the internal oblique and the transverse muscles in the line of their fibers, and opening the transversalis fascia near the hernia cyst neck (separating the joint between the transversalis fascia and the hernia cyst neck). The underlying peritoneum is not opened. By the time the posterior inguinal wall emerged, the hernia is easily recognized after the identification of the vas deferens and the spermatic blood vessels. The

femoral vessels are easily identified. A small opening is made on the mesh to accommodate the spermatic cord and vessels. The next step is the placement of the mesh. The medial, superior, and lateral borders of the mesh are then anchored in the pubic tubercle, the transversalis fascia and the inguinal ligament, by sutures of 1-0 Prolene. The results included duration of surgery, hospital stay and complications and recurrence ratio.

The data were analyzed using the Statistical Package for Social Sciences version 10.0 (SPSS Inc., Chicago, IL, USA). One way analysis of variance test, Chi square test, and paired test was used for statistics. The probability value of <0.05 was considered statistically significant.

Results. There were 12 direct and 98 indirect hernias (n=110). The mean patient age was 61 years (18-76 years). There were 100 men (mean age: 62), and 10 women (mean age: 51). The average operating time was 45 minutes (30-70 minutes). There was no intra-operative complication, and there was no post-operative mortality in this study. Two patients (18%) suffered from moderate scrotal hematoma, and recovered after pumped therapy by injector was applied. Mean follow-up time was 12 months (1-18 months), and 98% of the patients were included in the follow-up. Verbal rating scale was used to assess post-operative pain. The classification of post-operative pain was divided into 4 different levels such as: no pain, slight pain, moderate pain, and severe pain. Incisional pain was minimal, 101 patients had slight pain, and 9 patients had moderate pain. The duration of incisional pain was 2-3 days and no patient required post-operative analgesia. The patients began to get out of bed, 6 hours post-operatively. The hospital stay was 3-4 days. There was no patient with deep venous thrombosis, no pulmonary embolus, no surgical site infection, no mesh-related complications, no recurrent hernias in our early post-operative follow-up period.

Discussion. Inguinal hernia repair with CSEA, which is commonly used in China, takes on a series of disadvantages including prolonged fasting time and inactivity in bed, that may hold back the recovery of patients, and thus increase the percentage of post-operative complications and results in an extended length of hospital stay. It was the aim of our study to investigate the effect of local anesthesia in inguinal hernia repair with tension-free hernioplasty. There was no case of chronic pain related to the hernia repair. Similarly, Erhan *et al*⁶ reported a high ratio (5%) in his study. The high ratio could be explained by the pain that was present occasionally, and was related to physical stress. All patients were able to work in his study.⁶ There were 2 minor complications in our study. Similarly,

Fasih et al reported a low complication ratio (1.8%).¹³ McGreevy reported that fewer complications were experienced by patients undergoing laparoscopic repair (8 versus 21%, $p=0.03$)¹⁴ Likewise, Swenson reported that missed enterotomy was the only factor significantly associated with time to mesh infection (75% in the early group, $p=0.0001$)¹⁵ Franklin also reported that there were no mesh complications, or recurrent hernias in the early post-operative follow-up period.¹⁶ Our results demonstrate no recurrence during a median follow-up of 12 months. This observation is similar to Holzheimer,⁵ that reported low recurrence ratio (1.1%) in his study. The recurrence ratio was associated with surgical experience.⁵ The patients began to get out of bed in 6 hours, post-operatively in our study. This means quick recovery and return to work. But, the use of local anesthesia in tension-free hernioplasty applies difficult to complex hernia patients, such as recurrent hernia, huge hernia and strangulated hernia. If the current local anesthetic method failed to provide satisfactory anesthetic effects, supplementary intravenous anesthetics may be needed requiring patients to be hospitalized to complete the operation.

We have based our study on 110 patients only. We believe the results would be much better if we conducted the study on a larger sample size, including other cities of China, as well.

In conclusion, the use of local anesthesia in tension-free hernioplasty for inguinal hernia repair was a safe and effective method. However, long-term studies assessing the use of local anesthesia will be required to help determine the results.

References

1. Rutkow IM. Demographic and socioeconomic aspects of hernia repair in the United States in 2003. *Surg Clin North Am* 2003; 83: 1045-1051.

2. Bay-Nielsen M, Kehlet H, Strand L, Malmström J, Andersen FH, Wara P, et al. Quality assessment of 26,304 herniorrhaphies in Denmark: a prospective nationwide study. *Lancet* 2001; 358: 1124-1128.
3. Nilsson E, Haapaniemi S, Gruber G, Sandblom G. Methods of repair and risk for reoperation in Swedish hernia surgery from 1992 to 1996. *Br J Surg* 1998; 85: 1686-1691.
4. Hair A, Duffy K, McLean J, Taylor S, Smith H, Walker A, et al. Groin hernia repair in Scotland. *Br J Surg* 2000; 87: 1722-1726.
5. Holzheimer RG. Low recurrence rate in hernia repair—results in 300 patients with open mesh repair of primary inguinal hernia. *Eur J Med Res* 2007; 12: 1-5.
6. Erhan Y, Erhan E, Aydede H, Mercan M, Tok D. Chronic pain after Lichtenstein and preperitoneal (posterior) hernia repair. *Can J Surg* 2008; 51: 383-387.
7. Miyazaki K, Nakamura F, Narita Y, Dohke M, Kashimura N, Matsunami O, et al. Comparison of Bassini repair and mesh-plug repair for primary inguinal hernia: a retrospective study. *Surg Today* 2001; 31: 610-614.
8. Rutkow IM, Robbins AW. "Tension-free" inguinal herniorrhaphy: a preliminary report on the "mesh plug" technique. *Surgery* 1993; 114: 3-8.
9. Rutkow IM, Robbins AW. Mesh plug hernia repair: a follow-up report. *Surgery* 1995; 117: 597-598.
10. Amid PK, Shulman AG, Lichtenstein IL. Open "tension-free" repair of inguinal hernias: the Lichtenstein technique. *Eur J Surg* 1996; 162: 447-453.
11. Lichtenstein IL, Shulman AG, Amid PK, Montllor MM. The tension-free hernioplasty. *Am J Surg* 1989; 157: 188-193.
12. Amid PK. Lichtenstein tension-free hernioplasty: its inception, evolution, and principles. *Hernia* 2004; 8: 1-7.
13. Fasih T, Mahapatra TK, Waddington RT. Early results of inguinal hernia repair by the 'mesh plug' technique—first 200 cases. *Ann R Coll Surg Engl* 2000; 82: 396-400.
14. McGreevy JM, Goodney PP, Birkmeyer CM, Finlayson SR, Laycock WS, Birkmeyer JD. A prospective study comparing the complication rates between laparoscopic and open ventral hernia repairs. *Surg Endosc* 2003; 17: 1778-1780.
15. Swenson BR, Camp TR, Mulloy DP, Sawyer RG. Antimicrobial-impregnated surgical incise drapes in the prevention of mesh infection after ventral hernia repair. *Surg Infect (Larchmt)* 2008; 9: 23-32.
16. Franklin ME Jr, Gonzalez JJ Jr, Michaelson RP, Glass JL, Chock DA. Preliminary experience with new bioactive prosthetic material for repair of hernias in infected fields. *Hernia* 2002; 6: 171-174.

Related topics

Al-Mulhim AS. Pain after inguinal hernia repair. Possible role of bowel preparation. *Saudi Med J* 2007; 28: 1682-1685.

Karcaaltincaba D, Avsar F, Iskender C, Korukluoglu B. Unusual mechanism of isolated torsion of fallopian tube following minor trauma. Herniation through a broad ligament tear. *Saudi Med J* 2007; 28: 637-638.

Yarmohammadi H, Ghahramani L, Talei A. Intestinal obstruction. A rare delayed presentation of traumatic diaphragmatic hernia. *Saudi Med J* 2006; 27: 1425-1426.