

## Five years experience in inguinal hernia repair using local anesthesia .

-Adel Shaker Al Tamimi,(M.B.CH.B, C.A.B.S, F.I.C.M.S)  
Teacher, Dep.t of surgery , college of Medicine , AL-Qadissiah  
university.

- Adel Mosa Al – Rekabi Assistant professor in surgery ,  
M.B.CH.B , D.S , F.I.C.M.S college of Medicine AL-Qadissiah  
university.

### المخلص

تمت دراسة مئة وستة وثلاثين مريضاً يشكون من الفتق المغبني في مستشفى بغداد والديوانية التعليمي والذين تمت معالجتهم جراحياً وباستخدام التخدير الموضعي . خلال الفترة بين شباط 2002 حتى تشرين الأول 2007 صممت الدراسة لتقييم عدة مقاييس والتي تدعم فوائد أو أضرار استخدام التخدير الموضعي أثناء رفاة الفتوق المغبنة عولج غالبية المرضى باستخدام طريقة لكتنشتاين أو طريقة عدم تثبيت الشبكة ، وعدد قليل عولج بطريقة الريافة . تمت عملية تخدير المنطقة المغبنة لكل المرضى ابتداءً باستخدام المخدر الموضعي، في احد عشر حالة احتاجوا إلى مهدنات إضافية، وفي خمس حالات فقط تمت الحاجة إلى التحول إلى نوع آخر من التخدير . تم اختيار التخدير الموضعي للمرضى غير المناسبين للتخدير العام كلياً أو جزئياً . الفائدة من عدم الإحساس بالألم كلياً أثناء وبعد العملية، وفائدة استخدام الشبكة الصناعية الذي يضيف السرعة والبساطة للعملية أثناء العملية عند استخدام التخدير الموضعي . أظهرت الدراسة أن السيطرة على الألم بشكل ممتاز في 64,7% من المرضى و في 3% فقط تم التحول إلى نوع آخر من التخدير العام ، في ما يخص السيطرة على الألم بعد العملية وجد أن 93,8% من المرضى الذين استخدم فيهم البيوبيفاكين يحتاجون فقط إلى مهدنات بسيطة مقارنة مع 89,3% من المرضى الذين استخدم فيهم اللايدوكين تمت الحاجة إلى مهدنات قوية وعن طريق الحقن . بالنسبة لأفضل طريقة لرتق الفتوق المغبنة عند استخدام التخدير الموضعي هي طريقة استخدام الشبكة وبدون تثبيت . فيما يخص الصعوبات التي نشأت فهي قليلة منها صعوبة إرجاع محتويات الفتق و صعوبة شد الجرح أثناء العملية . أما نسبة التحول إلى نوع آخر من التخدير كان 11,8% . فيما يخص المحددات لاستخدام التخدير الموضعي هي الفتوق الكبيرة غير القابلة للإرجاع والفتوق المختنقة .

### Abstract

**Background :** Groin hernia is a common pathologic entity, and its incidence is high in adults older than 65. Further, geriatric patients who are candidates for herniorrhaphy often have concomitant diseases that increase the surgical risk. Cardiovascular, pulmonary, and urinary complications can occur after hernioplasty, especially if the procedure is performed under general or spinal anesthesia. Conversely, patients who receive local anesthesia do not generally have serious intra- or postoperative complications.

**Objectives:** the study is designed to assess several parameters that might support the benefit or the adverse from using local anesthesia during repair of inguinal hernia.

**Methods :** during the period from February 2002 to October 2007, one hundred thirty six patients with inguinal hernia attending Baghdad and Al Diwaniya teaching hospitals were managed by surgical repair utilizing local anesthesia. Most patients were managed by hernioplasty using Lichtenstien repair or suture less method , few patients were managed by herniorrhaphy using Darn repair , in all patients local anesthetic were used initially for inguinal field block. The choice of local anesthesia was limited to patients who are partially or totally unfit for general anesthesia.

**Results :** In our study 64.7%of patients have excellent intra operative pain control while 3% were converted to other mode of anesthesia , regarding post operative pain control 93.8% of those in whom bupivacain was used they need only simple oral analgesics as compared to 89.3%of patients in whom Lidocain was used , they require an injectable analgesics including narcotic one. Regarding the best approach to repair inguinal hernia it is found that suture less method is the most appropriate when local anesthesia is selected . Regarding technical difficulties occasionally arise during reduction of the contents and improper retraction during surgery .The rate of conversion to other mode of anesthesia was 11.8 %. Limitations of using local anesthesia are large irreducible hernia and when there are signs and symptoms of strangulation.

**Conclusion :** local anesthesia is effective method in inguinal hernia repair , especially when bupivacaine is used.The advantage of using prosthetic materials for repair is to add simplicity and quickness for the operation while using local anesthetic drugs .

**Aim of the study :** To evaluate the feasibility and safety and effectiveness of local anesthesia during inguinal hernia repair .

## **Introduction**

Groin hernia is a common pathologic entity, and its incidence is high in adults older than 65.<sup>{1}</sup> Further, geriatric patients who are candidates for herniorrhaphy often have concomitant diseases that increase the surgical risk. Cardiovascular, pulmonary, and urinary complications can occur after hernioplasty, especially if the procedure is performed under general or spinal anesthesia.<sup>{2,3}</sup> Conversely, patients who receive local anesthesia do not generally have serious intra- or postoperative complications.<sup>{3,4}</sup> Hernia repair under local anesthesia like other regional anesthesia has become in common use during the last four decades owing to the advances in needle technology , the appearance of nerve stimulators , and , most importantly ,the availability of rapidly acting safe local anesthetic drugs with an adequate duration of action have all combined to make regional anesthesia quick , safe and reliable .<sup>{5}</sup> The advantages of total pain relief both during and after surgery are clear <sup>{5,6}</sup> .Local anesthesia is also considered acceptable in terms of costs.<sup>{4}</sup> Consequently, to

increase safety and, if possible, to reduce costs, the surgical treatment of a common disorder such as groin hernia should be performed using surgical techniques that, proven to be effective, can be carried out under local anesthesia. In keeping with this policy, anterior tension-free mesh or plug hernia repair under local anesthesia;{7,8} other surgical and anesthetic techniques were used only for incidental situations.{3,9,10} In private, specialized hernia centers, local anesthesia (LA) is often preferred for day-case open hernia repair. This is in contrast to large epidemiologic surveys, in which LA is used in only 2%–15% of cases. Despite this, it represents a near-ideal technique because of its simplicity, low cost, and lack of potentially detrimental cardiovascular effects observed with regional or general anesthesia.{3,4,10} The ideal local anesthetic technique used for inguinal hernia repair is the ilioinguinal field block which entail anesthetizing three nerves , ilioinguinal, iliohypogastric, and genitofemoral nerves.{6,11} After leaving the pelvis the iliohypogastric nerve (T12, L1,L2) , lies between the aponeuroses of the external oblique muscle and the internal oblique . It innervates the lateral buttock area , and then runs medially , superficial to the inguinal canal , to supply the suprapubic area . the ilioinguinal nerve lies deep to the internal oblique muscle to enter the inguinal canal and runs in the male with the spermatic cord to supply the skin at the root of the penis and anterior scrotum . In the female it supplies the mons pubis and labia majora . The nerve also supply the upper and inner aspect of the thigh . The genitofemoral nerve (L1, L2 ) supplies the spermatic cord and the skin in a distribution similar to the ilioinguinal nerve via its genital branch , and the skin over the femoral canal via its femoral branch{11,12} . Inguinal field block provides excellent analgesia for 6-12hrs if bupivacaine is used and is particularly useful for day-case patients . {5,6} . Inguinal field block can be used alone or in combination with light general anesthesia for inguinal hernia repair . {5,6,11} . Complications related to inguinal field block per se including allergy to local anesthetic drugs , methaemoglobinaemia (specific for prilocaine ) , neurological damage and neurotoxicity , haematoma formation , infection and fainting all are rare , but systemic toxicity is important avoidable complications , which occur due to serum concentration that is too high , this can result either from an absolute over dose or inadvertent intravenous administration of the drug{6,11} The manifestations of systemic toxicity varies from mild , numbness of tongue , light headedness , visual disturbance , to severe life threatening effects like coma, respiratory arrest and CVS depression , and transient quadriplegia , a rare documented complication . {6,11}

## Patients and method

From February 2002 to October 2007, one hundred thirty six male patients their age ranged from 45-70 years, who has attended Baghdad and Al Diwaniya teaching hospitals complaining of inguinal hernia , most patients were old , with chronic respiratory, CVS or other medical problems rendering them partially or totally unfit for GA, for this reason they were a good candidates for local anesthesia , other fewer patients they chose local anesthesia despite of fitness for GA .

**Method:** following thorough discussion with patient regarding the benefit of lower risk , cooperation needed , and after preoperative preparation , the patient is placed in supine position , except patient with orthopnia who is placed in semi sitting position . Following full aseptic preparation , the anterior superior iliac spine is located , at a point 2cm medial and 2cm caudal to this point , a 22-gauge needle is introduced perpendicularly , the needle is advanced until the aponeurosis of external oblique is reached , when a slight increase in resistance is noted . At this point , the needle can be moved freely from side to side and the aponeurosis scratched , this should be done after a small amount of local anesthetic is injected because it can be painful . The needle is advanced through the aponeurosis often with a ;pop; . side –to- side movement is no longer possible . After aspiration , 5-6 ml of local anesthetic is injected . The needle is then advanced 1-2 cm through the internal oblique muscle and other 5ml of local anesthetic is injected . Alternatively , the oblique muscle can be infiltrated in a fan , from the same point , using 10ml of local anesthetic . In either case , the needle is then with-drawn to the skin , and further 10ml infiltrated in a fan shape subcutaneously , blocking any cutaneous innervation from the subcostal nerve . The genitofemoral nerve is blocked by an injection of 10 ml of local anesthetic in a fan from the pubic tubercle towards the external inguinal ring and then to the midline . In an awake patient , further injection of local anesthetic may be required into the deeper structures by the surgeon during surgery . The total dose of local anesthetic used , within the toxicity limits , is typically 20ml(max.40ml)of 0.25- 0.50% bupivacaine with epinephrine , or the equivalent in lignocaine .{5,6,11,13} An inguinal canal block may be used to supplement this block for procedures where analgesia of scrotal sac is required .{6,13}

## Results

**Table -1: Demonstrates the assessment of intra operative pain control and the rate of conversion to other mode of anesthesia .**

Pain control	No.	%	Notes
Excellent	88	64.7	
Good	32	23.5	Additional Dose
Fair	11	8.1	Add. Dose +sedation
Poor	5	3.7	Conversion

**Table -2 : Shows the benefit of post operative pain control in terms of post operative requirement for analgesia in 2 types of local anesthetics used**

L A	No.	Need for post operative analgesia			
		Negative		Positive	
		No.	%	No.	%
Bupivacaine	80	75	93.8	5	6.2
Lignocaine	56	1	1.8	55	98.2

Regarding the best local anesthetic , both bupivacaine and lignocaine were used , each of specific advantages and disadvantages , in an anxious patient , with greater cardiac risk , and when the procedure expected to be short , lignocaine were the anesthetic of choice on the coast of the benefit of prolonged post operative pain relive together with its added antithrombotic,anti-inflammatory, and anti-microbial effect while in most patients bupivacaine were used successfully to overcome intra and post operative pain , in both types epinephrine were added except in patient with resistant hypertension.Regarding technical difficulties that arise during the procedure were minor , infrequent and passed easily , among which is the difficult reduction of the content and the improper retraction of the wound edges during darn and to lesser extent , lichtenstien repair , Limitations of repairing inguinal hernia using local anesthesia are , very large irreducible hernia and beyond doubt when there is signs and symptoms of strangulation .

Complications related to the local anesthetics per se or the procedure of block were infrequent with one patient develop wound haematoma , few patients develop numbness of the tongue and transient visual disturbance especially while using pubivacaine .

**Table- 3: demonstrates the most appropriate repair procedure to be done under local anesthesia in terms of the time required for repair , and the need for retraction of wound edges .**

Parameters	Lichtenstein	Suture less	Darn
Time min	5 -8	2 -4	10 -15
Need for Retraction	Moderate	Minimal	Strong

## **Discussion**

The use of local anesthesia during inguinal hernia repair was practiced since the introduction of more safe local anesthetic drugs and the accurate delineation of peripheral nerves using nerve stimulators {3}. In this study the use of unassisted local anesthesia was successful to complete the operation in 88.2% of patients, 8.1% needs additional sedation, while in 3.7% (5 patients) they couldn't cope with local anesthesia and rapidly converted to light general anesthesia. Glassow F. {13} has reported no conversion rate, this difference might be attributed to the better preoperative explanation and psychotherapy. The benefit of post operative analgesia was assessed in terms of the need for post operative analgesia in the immediate post operative period {3,4}, when bupivacaine was used 93.8% of patients did not need an analgesic for the following 6 hrs post operatively, while 98.2% of patients in whom lignocaine was used they ultimately need a post operative injectable analgesic.

Regarding the best local anesthetic to be used among the two popular drugs (lignocaine and bupivacaine) it is found that bupivacaine is more useful, since it permits more prolonged surgery and beyond doubt its advantage of prolonged post operative analgesia, however when cardiac toxicity occurs resuscitation is less successful than lignocaine, because it is difficult to replace the drug from the myocardium. Furthermore, lignocaine has a theoretical antithrombotic, anti-inflammatory, and anti-microbial effect {2,13}, these results are comparable with other studies, however Nordin P et al recommend the use of local anesthesia while repairing inguinal hernia in every adult patient. Technical difficulties arise during the procedure were easily passed off, among which, difficult reduction of the hernia content and improper retraction of wound edges, which was experienced in a decreasing frequency in darn, Lichtenstein, and sutureless hernioplasty, all are due to muscular non relaxation {9,10,13}. Limitations of using this method are, very large irreducible hernia and when there is sign and symptoms of strangulation. {2}

The most appropriate repair to be done under local anesthesia in terms of time required for repair and the need for retraction, it is found that sutureless repair requires minimal time needed to lay down the mesh with very minimal retraction needed to spread the mesh over the posterior wall, a well studied fact by Gilbert AL who pioneered the sutureless method {10}, while in Lichtenstein repair a little more time should be spent and more stronger retraction during fixation of the mesh, moreover while a darn repair is a useful procedure, we don't recommend it when local anesthesia is selected, due to the longer time spent, and the more aggressive retraction needed during the repair.

## **Conclusions**

1. Local anesthesia is safe . effective , method for patients with inguinal hernia who are partially or totally unfit for general anesthesia .
2. Bupivacaine is the most appropriate local anesthetic with its benefit of prolonged post operative analgesia .
3. Suture less method is the most appropriate method of repair owing to its simplicity, rapidness and the less need for retraction .
4. local anesthesia should be avoided in large irreducible and strangulated hernia .

### References

1. Seymour, I. Schwartz , G. Tom Shires , Frank C. Spencer. Principles of surgery 7<sup>th</sup> ed. 2000 p. 1600.
2. Nordin, P . Zetterstrom H , Gunnarsson U, et al . Local , regional or general anesthesia in groin hernia repair , multicenter randomized trial . Lancet 2003 ;362:853
3. Peter Hutton , Griselda M Cooper , Francis M James III and John F , Butter worth Iv , Fundamental principles and practice of anesthesia 2002
4. Prithvi Raj. Clinical practice of regional anesthesia . Edinburgh ; Churchill Livingstone , 1991.
5. Michael J. Zinner , Stanley W. Ashley. Maingot s Abdominal operations p. 108 : copyright 2007 .
6. Rutkow IM , Robbins AW. Demographic , Classificatory and socioeconomic aspects of hernia repair in the united states . surg. Clin. North Am 1993;73 :413.
7. Wild smith JAW , Armitage EN .Principles and practice of regional anesthesia , 2<sup>nd</sup> Ed . Edinburgh ;Churchill Livingstone , 1993.
8. Anson BJ . Mcvay CB. The anatomy of inguinal and hypogastric regions of the abdomen . Ana. Rec . 70:211, 1938.
9. Lichtenstein IL , Shulman AG et al : The tension – free hernioplasty . Am j. surg . 157 ;188, 1989.
10. Gilbert Al: Suture less repair of inguinal hernia . Am J surg. 163;331,1992 .
11. Young Dv . Comparison of local , spinal and general anesthesia for inguinal herniorraphy . Am J . surgery 1987;153:560.
12. Mulroy M . Regional anesthesia ;An illustrated procedure guide . 2<sup>nd</sup> ed . Chicago ;little brown , 1995.
13. Glassow F . Inguinal hernia repair using local anesthesia . Ann R coll surg. Eng 66;382, 1984.