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Original Article

Is Sutureless Hernia Repair a Safe Option for Treating Abdominal Wall Hernias? A Prospective Study With a Synthetic Tissue Adhesive (n-hexyl-alpha-cyanoacrylate)☆

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ABSTRACT

Introduction: The use of tissue adhesives can be an alternative to suture fixation of the mesh, but experience in their use is very limited.
Material and methods: A prospective descriptive study was conducted on a group of 35 patients with inguinal hernias repaired by sutureless hernioplasty (20 by open and 15 by endoscopic), the prosthesis was fixed with a synthetic adhesive (n-hexyl-α-cyanoacrylate). This group was compared with another 35 patients for hernia repair with fixation sutures. All patients were scheduled for outpatient surgery. Peri-operative variables were recorded. The patients were followed up at one week, one month, 6 months and one year after surgery.
Results: There was no morbidity associated with the use of tissue adhesive (bruising, infection or skin necrosis). During a median follow-up of 15 months, no complications or recurrences were detected. In the open hernioplasty using adhesive significantly reduced surgery time (30 min versus 70 min, $P=.001$), postoperative pain (from 2.4 to 4.5 at one week, $P<.001$) and analgesic consumption (7–14 days, $P<.001$). In the laparoscopic approach are demonstrated significant differences in favor of the adhesive in pain ($P=.001$ at 24 h), and in analgesic use ($P<.001$) was observed using the laparoscopic approach. The adhesive did not alter the morbidity or the relapse rate at one year in any of the two approaches, and the financial analysis showed an annual savings of 117 461.2 euros (about 460 hernias).
Conclusion: The use of a synthetic tissue adhesive (n-hexyl-α-cyanoacrylate) is safe as a means of fixation in uncomplicated hernia and patients without comorbidity, and with good postoperative results.

¿Es segura la hernioplastia sin sutura como opción para tratar las hernias de pared abdominal? Estudio prospectivo con un adhesivo tisular sintético (n-hexil-α-cianoacrilato)

Palabras clave:
Hernia inguinal

RESUMEN

Introducción: El uso de adhesivos tisulares puede ser una alternativa a la sutura en la fijación de la malla, pero su experiencia clínica es muy limitada.

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Adhesivo tisular
Cianoacrilato
Morbilidad
Recidivas

Material y métodos: Estudio prospectivo y descriptivo en un grupo de 35 pacientes con hernias inguinales operados mediante hernioplastia sin sutura (20 vía abierta y 15 vía endoscópica); la prótesis se fijó con adhesivo sintético (n-hexil-α-cianoacrilato). Este grupo se ha comparado con uno control operado mediante hernioplastia utilizando suturas. Todos los pacientes seguían protocolo de cirugía mayor ambulatoria. Se han registrado variables peri- y postoperatorias. El seguimiento se realizó a la semana, al mes, a los 6 meses y al año.
Resultados: No ha existido morbilidad asociada con el uso del adhesivo tisular. Durante una mediana de 15 meses no se han detectado complicaciones ni recurrencias. En la hernioplastia abierta el uso del adhesivo disminuye de forma significativa el tiempo quirúrgico (30 min versus 62 min, p = 0,001), el dolor postoperatorio (de 2.4 a 4.5 a la semana, $p < 0,001$) y el consumo de analgésico (de 7 a 14 días, $p < 0,001$). En el abordaje laparoscópico se demuestran diferencias significativas a favor del adhesivo en el dolor (p = 0,001 a las 24 h) y consumo de analgésicos ($p < 0,001$). El análisis económico demuestra un ahorro anual de 117.461,2 euros (sobre 460 hernias).
Conclusión: El uso de un adhesivo tisular sintético (n-hexil-α-cianocrilato) es seguro como medio de fijación en las hernioplastias no complejas en pacientes sin comorbilidad, con buenos resultados postoperatorios.

Introduction

Abdominal wall surgery is continuously changing. In recent decades, mesh has been accepted for repairing abdominal wall defects. We are currently witnessing a new cycle of changes as a consequence of the introduction of tissue adhesives, which are substances that can be used as hemostatics or adhesives in multiple medical-surgical processes.[1–5] Hernia treatment represents an elevated expenditure of resources within a general surgery department and can reach 15% of its overall activity. Tension-free hernioplasty has become the standard method for treating inguinal hernias because it is an effective, easily reproducible intervention that provides good results for most surgeons. However, this surgery still presents an important rate of postoperative pain.[6] This complication has been related to the use of sutures that may cause local compression (tissue ischemia), strangulation of muscle fibers, nerve damage, or foreign body reaction.

The purpose of this study is to assess the effectiveness of a synthetic tissue adhesive (n-hexyl-α-cyanoacrylate) in the treatment of inguinal hernia, with both open as well as laparoscopic approaches, as a substitute for sutures.

Methods

Study Design

This prospective, descriptive, non-randomized study compares the study group with a control group during the time period from January 2008 to January 2011; 35 patients were included, all diagnosed with inguinal hernias treated with tension-free hernioplasty. All patients were evaluated by a multidisciplinary unit specialized in abdominal wall disorders, where a detailed clinical history was taken and patients underwent physical examination.

Tissue Adhesive

A monomer of cyanoacrylate was used (n-hexyl-α-cyanoacrylate, IfabondTM, Fimed, France), which is a very pure adhesive with low viscosity that, when applied over living tissue in a moist basic environment, polymerizes rapidly and forms a flexible adhesive polymer in seconds. After 30 s, it provides strong fixation; its reabsorption is progressive and complete 3 months after application.

Inclusion/exclusion Criteria

The inclusion criteria included: patients over the age of 17 with inguinal hernias without comorbidity (DRG 162) who understood the process and gave their informed consent. In the case of unilateral hernias, types II and III of the Nyhus classification were included and proposed for anterior open hernioplasty. Bilateral hernias were considered for endoscopic total extraperitoneal repair. Exclusion criteria included scrotal hernias, recurrences, emergency surgery, the presence of infection or lack of signed informed consent.

Surgical Technique

(a) Open technique: under regional anesthesia, a Lichtenstein or Rutkow technique was performed. In the technique with sutures, a 5-cm plug was set with one stitch, and a flat polypropylene mesh measuring 15 cm×7.5 cm was placed using 2 size 2/0 polypropylene sutures (2/0 Prolene®, Ethicon, Chicago, USA), the aponeurosis of the external oblique muscle was likewise sutured with size 0, the subcutaneous tissue was closed with size 0 synthetic absorbable polyglycolic acid suture (SSA®, Ethicon, Chicago, USA) and the skin was closed with staples. In the technique without sutures, the surgical management of the region, hernia, sac and mesh position was the same, but both the plug as well as the flat mesh were attached with well-distributed drops of n-hexyl-α-cyanoacrylate, on the