Asian Journal of Surgery (2015) 38, 214–219

Available online at www.sciencedirect.com

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journal homepage: www.e-asianjournalsurgery.com

ORIGINAL ARTICLE

Short- and long-term results of harmonic scalpel hemorrhoidectomy versus stapler hemorrhoidopexy in treatment of hemorrhoidal disease

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Received 2 May 2014; received in revised form 23 August 2014; accepted 19 September 2014
Available online 4 November 2014

KEYWORDS
harmonic scalpel;
stapled hemorrhoidopexy

Summary *Purpose:* In this prospective randomized study, our aim is to compare the short- and long-term results of harmonic scalpel hemorrhoidectomy (HSH) and stapler hemorrhoidopexy (SH) methods in the surgical treatment of Grade III and Grade IV hemorrhoidal disease.
Methods: Ninety-nine consecutive patients diagnosed with Grade III or Grade IV internal hemorrhoidal disease were included in the study. Patients were randomized to HSH ($n = 48$) or SH ($n = 51$) treatments. Data on patient demographic and clinical characteristics, operative details, postoperative pain score on a visual analog scale, additional analgesic requirement, postoperative short- and long-term complications, and recurrence of hemorrhoidal disease were also recorded. Patients were regularly followed for a total period of 24 (6–36) months.
Results: The patient demographic and clinical characteristics were similar in the two groups. The operative time was significantly shorter in the HSH group compared with the SH group. Overall pain scores were not significantly different between the groups, although severe pain was significantly more common in the HSH group. Recurrence was significantly lower in the HSH group compared with the SH group.
Conclusion: HSH and SH are both safe and effective methods for surgical treatment of Grade III and Grade IV hemorrhoidal disease. In our study, the HSH method was determined to be safer, easier, and faster to perform, and associated with fewer long-term recurrences than the SH method.

Conflicts of interest: We have no conflicts of interest with any organization or individual.

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http://dx.doi.org/10.1016/j.asjsur.2014.09.004

1. Introduction

Hemorrhoidal disease is a very common anorectal disorder, occurring in approximately 5% of the general population, and more frequently in individuals who are older than 40 years.[1,2] Surgical treatment is required in cases having symptomatic Grade III and Grade IV hemorrhoids. Additionally, surgery may be required when medical treatment fails or in the presence of concomitant conditions such as anal fissures or ulcers. There are various techniques used in the surgical treatment of hemorrhoidal disease. Conventional techniques include Ferguson's closed hemorrhoidectomy and Milligan—Morgan's open hemorrhoidectomy, which can be performed with scalpel or electrocautery. Additionally, a variety of devices and methods have been introduced to help facilitate the procedure and minimize patient discomfort in the postoperative period.

Harmonic scalpel (Ethicon Endo-Surgery Inc., Cincinnati, OH, USA), which was introduced for the first time in 1992, uses ultrasound energy to cut and coagulate soft tissue, with minimal thermal damage to the surrounding tissue.[3] Harmonic scalpel has been used extensively in general surgery procedures such as cholecystectomy, hemorrhoidectomy, and thyroidectomy; gynecological procedures such as myomectomy; and to cut internal mammary artery in thorax surgery.[4] Currently, harmonic scalpel hemorrhoidectomy (HSH) is used as a routine technique in many centers. In HSH, postoperative pain is purported to be minimal, as thermal damage to the surrounding tissue is avoided. During the surgery, harmonic scalpel seals bleeding vessels and forms protein coagulum. When used in hemorrhoidectomy, this method minimizes bleeding of large hemorrhoids and decreases operative time.

It has been 15 years since Longo[5] introduced the use of stapler hemorrhoidopexy (SH) in prolapsed hemorrhoidal disease in 1998. The initial results of five randomized trials conducted in 2000 were encouraging when comparing SH with conventional hemorrhoidectomy.[6—10] In addition to obliterating submucosal vessels, SH aims to bring prolapsed rectal mucosa back to a natural level and rectify the topographic relation between the anorectal mucosa and the underlying muscle.[5] In this method, a ring of rectal mucosal—submucosal tissue is resected approximately 3—4 cm above the dentate line, disrupting distal branches of superior rectal artery feeding the hemorrhoids and restoring the prolapsed hemorrhoidal plexus to original anatomical position.[11] Because SH involves the rectum where pain sensation is absent instead of the anoderm, theoretically it promises less postoperative pain and shorter hospitalization compared to conventional methods. Following its introduction, thousands of patients were operated on with this technique in Europe.[12]

In this prospective study, we compared the short- and long-term results of HSH and SH, two techniques that are routinely used all over the world, in the surgical treatment of Grade III and Grade IV hemorrhoidal disease, and presented our results in comparison with the existing literature. It might seem more logical to compare HSH with the traditional electrical energy of diathermy or traditional open hemorridectomy (Milligan—Morgan), but it should be noted that we are using both SH and HSH techniques in the treatment of hemorrhoidal disease in our surgical department. Additionally, there is only one prospective randomized study comparing these techniques in literature. So, our aim was to contribute to the literature with this study.

2. Materials and methods

Patients presenting to the General Surgery Department of Istanbul Okmeydani Training and Research Hospital, Istanbul, Turkey with various complaints related to the anal area were screened in a time span of 4 years; after physical and sigmoidoscopic examination, 99 patients diagnosed with Grade III or Grade IV internal hemorrhoidal disease were included in the study. The exclusion criteria were previous anorectal surgery, acute thrombosed hemorrhoid, external hemorrhoids, concomitant anal diseases such as anal fissure, fistula, or abscess, hematologic disease, anticoagulant use, and cancer. Medical history and current symptoms were investigated in detail. Detailed physical examination and rigid rectosigmoidoscopy were performed on all patients. All patients with indication for surgical treatment were informed about the procedures. Purgative enema was applied 1 day prior to the surgery. All 99 patients were operated on while they were in the lithotomy position, under general anesthesia. Local adrenalin infiltration, local anesthesia, or pudendal nerve block methods were not performed. Prophylactic single-dose first-generation cephalosporin (cephazolin sodium) was delivered parenterally to all patients. Patients were randomized to surgery using HSH ($n = 48$) or SH ($n = 51$) methods.

HSH cases were operated using the Ethicon Harmonic Scalpel 300 (Ethicon Endo-Surgery Inc.). Suture was not used; islands of at least 8—10 mm were left between the excised hemorrhoid and the skin. A PPH01 Kit (Ethicon Endo-Surgery Inc.), which consisted of a circular anal dilator (CAD 33), a purse-string suture anoscope (PSA), a suture threader, and a 33-mm hemorrhoidal circular stapler, was used while SH was being performed. The purse-string was done between 3 cm and 4 cm above the dentate line; the purse-string was completed with six to eight stitches, which included only the mucosal and submucosal layers, and hemostatic stitches using a 3—0 vicryl (Ethicon Endo-Surgery Inc.) suture on a round body 16—18 mm needle were used in case of bleeding.

Evaluation parameters included age, sex, presenting symptoms, disease grade, operative time, duration of hospitalization, return to daily activities, postoperative complications, and postoperative pain. Short- and long-term complications were assessed on follow-up outpatient visits at postoperative Month 1, Month 6, and Month 24. Patients with Grade III and Grade IV disease were evaluated together and separately.

Postoperative pain was assessed with a linear visual analogue pain scale (VAS) by the patient, surgeon, and an independent blinded assessor. The VAS scores were grouped as mild (0—3), moderate (4—6), and severe (7—10).[13] The analgesic given was diclofenac sodium with a maximum dose of 2.5 mg/kg/d (intramuscularly in the first 24 hours and via the oral route thereafter). In severe pain, opioid analgesic (pethidine 1 mg/kg) was given in one or two doses