Conventional (CH) vs Stapled Hemorrhoidectomy (SH) in surgical treatment of hemorrhoids

Ten years experience

Ann. Ital. Chir., 2012 83: 129-134

Simone Manfredelli, Gioacchino Montalto, Giovanni Leonetti, Marco Covotta, Chiara Amatucci, Alfredo Covotta, Angelo Forte

IV Scuola di Specializzazione in Chirurgia Generale, Direttore Prof. Francesco Vietri
Department of Surgery "F. Durante", Sapienza University, Rome

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INTRODUCTION: *Interest about hemorrhoids is related to its high incidence and elevated social costs that derive from its treatment. Several comparative studies are reported in Literature to define a standard for ideal treatment of hemorrhoidal disease. Radical surgery is the only therapeutic option in case of III and IV stage haemorrhoids. Hemorrhoids surgical techniques are classified as Open, Closed and Stapled ones.*
OBJECTIVE: *We report our decennial experience on surgical treatment focusing on early, middle and late complications, indications and contraindications, satisfaction level of each surgical procedure for hemorrhoids.*
METHODS: *Four hundred fortyeight patients have been hospitalized in our department from 1st January to 31st December 2008. Of these 241 underwent surgery with traditional open or closed technique and 207 with the SH technique according to Longo. This retrospective study includes only patients with symptomatic hemorrhoids at III or IV stage.*
RESULTS: *There were no differences between CH and SH about both pre and post surgery hospitalization and intraoperative length. Pain is the most frequently observed early complication with a statistically significant difference in favour of SH. We obtain good results in CH group using anoderma sparing and perianal anaesthetic infiltration at the end of the surgery. In all cases, pain relief was obtained only with standard analgesic drugs (NSAIDs). We also observed that pain level influences the outcome after surgical treatment. No chronic pain cases were observed in both groups. Bleeding is another relevant early complication in particular after SH: we reported 2 cases of immediate surgical reintenvention and 2 cases treated with blood transfusion. Only in SH group we report also 5 cases of thrombosis of external haemorrhoids and 7 perianal hematoma both solved with medical therapy. There were no statistical significant differences between two groups about fever, incontinence to flatus, urinary retention, fecal incontinence, substenosis and anal burning. No cases of anal stenosis were observed. About late complications, most frequently observed were rectal prolapse and hemorrhoidal recurrence, especially after SH.*
DISCUSSION AND CONCLUSION: *Our experience confirms the validity of both CH and SH. Failure may be related to wrong surgical indication or technical execution. Certainly CH procedure is more invasive and slightly more painfull in immediate postoperative period than SH surgery, which is slightly more expensive and has more complications. In our opinion the high risk of possible early and immediate complications after surgery requires at least a 24 hours hospitalization length. SH is the gold standard for III grade haemorrhoids with mucous prolapse while CH is suggested in IV grade cases. Hemorrhoidal arterial ligation operation (HALO) technique in III and IV degree needs further validations.*

KEY WORDS: Anorectal dysfunction, Complications, Hemorrhoidectomy, Longo stapled hemorrhoidopexy, Milligan-Morgan hemorrhoidectomy.

Introduction

Recently there is a great interest about surgical treatment of hemorrhoidal disease, due to high social cost [1]. The ideal surgical treatment should achieve a radical result with a low complications rate and a fast return to work and social activities, containing health costs [2]. Regarding IIIrd and IVth grade hemorrhoids the only curative treatment is surgery by open or closed techniques. Among surgical techniques currently available, open Milligan-Morgan is the most performed and universally accepted for its good outcomes and lower costs [3-5]. There is also a closed technical variation, named Ferguson; both techniques, Milligan-Morgan and Ferguson, are classified as

Pervenuto in Redazione Maggio 2011. Accettato per la pubblicazione Novembre 2011
Correspondence to: Angelo Forte, MD, Department of Surgery "F. Durante" University of Rome Sapienza, Viale del Policlinico, 00161 Rome, Italy (E.mail: angelo.forte@uniroma1.it).

conventional hemorrhoidectomy (CH). Stapled hemorrhoidectomy (SH) according to Longo's technique, is indicated for correction of both mucosal and hemorrhoidal prolapse. SH technique doesn't remove hemorrhoidal cushions but avoids bleeding by interruption of terminal branches of superior hemorrhoidal artery [2,6-12]. This retrospective study evaluates results of both CH and SH techniques after 10 years about early, middle and late complications, level of satisfaction, indications and contraindications for each surgical procedure.

Materials and Methods

In Surgical Department "Francesco Durante" Sapienza University of Rome, between January 2000 and December 2009, 448 patients underwent a surgical treatment for IIIrd or IVth degree symptomatic hemorrhoids with CH (Milligan Morgan or Ferguson technique) or SH (Longo's one). Mean age was 44,8 years (range 18-79), with 226 men (50.5%) and 222 women (49.5%). All patients were treated by inpatient elective recovery. Inclusion criteria were bleeding and III or IV grade hemorrhoidal prolapse. All patients were evaluated preoperatively with a complete proctological examination including past proctologic history, continence evaluation (Wexner index score) [29], anoscopy or colonscopy (only patients older than 50 years). Exclusion criteria were previous anorectal surgery, concomitant anorectal disorders, pregnancy, HIV, intestinal chronic disease, fecal incontinence, liver cirrhosis. All patient were treated with CH or SH technique, by the same surgeon equipe. The tobacco pouch in Longo's procedure were always performed between 2.5 and 3 cm above pectinate line. As Preoperative protocol, all patients, were cleaned by a saline enema on the evening before operation. All interventions were performed with patients in lithotomy position. The type of anesthesia, general or spinal, was performed according to surgeon, anesthetist and patient. Standardized antibiotic prophylaxis was performed by intravenous administration 30' before for all interventions, according to short term therapy, with amoxicillin and clavulanic acid. In allergic patients we used the same protocol with a third generation cephalosporin or no antibiotic therapy. Postoperative pain was well controlled after the operation by a peri-anal Meperidine 7.5% 2 fl infiltration and by continuous analgesics infusion in first 24 hours. All patients were required to record pain from the first postoperative day with a self-administered visual analogic scale (VAS) in cm (0-10). Pain score 1-3 was considered moderate; 4-7 significant; 8-10 intolerable. In all patients, regardless of the surgical technique performed, a medicated swab was placed in anal canal which was removed after 24 h. All patients were dismissed after canalization with continence control without pain (VAS < 7). Patients were assessed for follow-up at one week, one month and six months after the operation. Everything concerning operative time, postoperative pain, day of discharge and time to return to work was recorded. All complications observed were classified in immediate (first 7 postoperative days), early (until 45 days) and late (after 45 days). At the end of follow-up (after 12 months from the intervention) a telephone interview was performed to check late complications and to evaluate the satisfaction level (0: no satisfaction; +1: moderate satisfaction; +2 high satisfaction).

Statistical Analysis. Data were expressed as median values, and values less than 0.05 were considered statistically significant. Mann-Whitney U-test was used for postoperative pain between CH and SH groups. Fisher exact test was used for the incidence of postoperative complications.

Results

Of all 448 patients treated, 241 (53.8%) were in CH group while 207 (46.2%) were assigned to SH group. In our experience there were no significant statistically differences about operative time in both groups (p-value >0.05) and in recovery time (p-value >0.05).

More frequent immediate complication observed was pain with a difference statistically significant in first 24 hours (p-value 0.05). After first post-operative day there were no differences on pain score between CH and SH groups (see Figure 1). Another immediate complication was bleeding that was more frequently observed CH after SH technique; 6 patients (2.5%) vs 12 SH patients (5.8%) (p-value > 0.05). Among SH bleeding group, 2 patient needed a blood transfusion and 2 required reintervention. Fever was more frequent in CH group (26 patients, 10.8%) than SH (6 patients, 2.9%) (p-value < 0.05). There were no differences between two groups for urinary retention (12 CH patients vs 11 SH patients) and incontinence to flatus (65 CH patients vs 57 SH patients) (p-value >0.05). Urinary retention was observed more frequently in male patients. Incontinence to flatus was self-limited within 45 days after intervention in all patients.

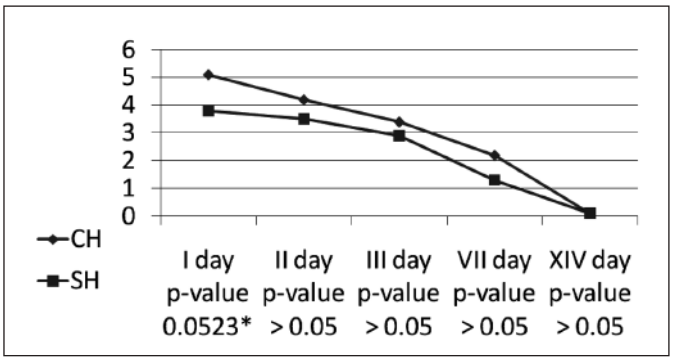

Fig. 1: Pain after surgery between two groups. Incidence is significantly different only in first postoperative day.

Among early complications there were no differences between two groups relate to incidence of perianal abscess and infections (p-value > 0.05). After SH technique were observed 5 cases (2.4%) of external hemorrhoidal thrombosis (p-value > 0.05) and 7 cases (3.4%) of perianal hematoma (p-value < 0.05). Soiling, anal burning and itching were most frequently recorded after SH but these data were not statistically significant (p-value > 0.05). Anal burning and itching were persistent after 45 days too (late complications). Anal stenosis was recorded in 8 CH patients (3.3%) and 7 SH patients (3.4%) (p-value > 0.05), all patients were treated, when this complication was persistent, with endoscopic dilatation.

Most frequently late complications observed were anal prolapse (2 cases in CH group, equal to 0.8%; and 7 in SH group, equal to 3.4%) and recurrence (3 cases after CH, 1.2% and 4 cases after SH, 1.9%) (p-value > 0.05 for both complications). Anal prolapse and recurrence were treated with reintervention after 1 year.

At the end of follow-up period satisfaction level was evaluated by phone interview in all patients: only 357 patients (79.7%) were available. There were no statistically significant differences between two groups for satisfaction level (p-value > 0.05), but 16 patients after CH technique were not satisfied (8.4%) versus only 1 patient after SH (0.6%).

Discussion

When and how surgically treats haemorrhoids are still two open questions to which surgeon have to answer; this is the objective of this retrospective 10 years study. Haemorrhoidal disease is due to constitutional predisposition, food habits and alteration of defecatory function [1]. Therapeutic approach have to act first on alimentation and alvus regularization. There are different therapeutic options, outpatient recovery or day-surgery, as HALO (Haemorrhoidal Artery Ligation Operation) 1[3]. Radical surgery is the only therapeutic option in case of III and IV stage haemorrhoids. Hemorrhoid's surgical techniques are classified into open, closed and stapled ones. Conventional Hemorrhoidectomy was developed in UK by Dr. Milligan and Dr. Morgan in 1937. In this procedure the three major hemorrhoidal blood vessels are excised [3-5], and to avoid stenosis, three pear-shaped incisions are left open, separated by bridges of skin and mucosa. This is the most popular hemorrhoid surgery procedure. It is considered the gold standard which other hemorrhoid surgery techniques are compared against. Stapled Hemorrhoidectomy is a newest technique and is the gold standard in III grade haemorrhoids with mucous prolapsed: the stapler removes the circumferential ring of expanded hemorrhoidal tissue trapped within the device and at the same time staples together the upper and lower edges of the removed tissue [2,7,14-16].

According to our experience both techniques require a general or spinal anesthesia hence inpatient recovery is necessary. Median operative length is similar (30 min), hospital discharge is possible 24 hours after intervention for both techniques. SH technique is slightly more expensive than CH due to the stapler device cost. Both interventions could lead to immediate, early and late complications (Tab. I). Small complications as low fever, short urinary retention, burning and anal itching, soiling, incontinence to flatus, that could be derived from several causes like surgical or anesthesia stress, comorbidity, local anatomical status. These are minor complications easy to manage. Rare complications, without any statistical differences between these techniques, are anal stenosis and surgical site infections (SSI). To prevent anal stenosis after CH is recommended anoderm preserving and keep mucous and cutaneous bridges. In our experience all cases of stenosis or sub-anal stenosis were treated and solved with conservative management by anal divulsion or endoscopic dilatation [17]. SSI with local pain and fever were treated by antibiotic therapy and local toilette to avoid any other complications and possible rectal perforation, rectal fistula or Fournier's gangrene.

Pain is the most frequent, fearsome and immediate complication, it still remain the major cause of discomfort in patient who undergoes this surgery. Pain is a complex, consciousness-dependent, unpleasant somatic experience with cognitive and emotional as well as sensory features. Pain perception is higher during first 24-48 hours after intervention and gradually decreases over following days. In our experience pain resolution is obtained after 14 days in both techniques (Chart 1). Pain may be absent after SH and this is the reason of a great consensus in Literature [14,18,19], clearly pain score difference in the first post-operative day is statistically significant (p-value < 0.05). A relevant data in our study is when pain is present, in CH group, it reaches an higher time length (Chart 1).

A significant pain reduction, in our experience, was obtained by anoderm preserving and overall by perianal anesthetic infiltration at the end of intervention in both techniques (Ropivacaine 7.5% 2 fl).

Often pain after SH is due to incorrect surgical performance, this data contrasts common surgeons consensus which identify stapled hemorrhoidectomy as a "simple" intervention [20].

Bleeding is another significant immediate complication, more frequent after SH than CH (Tab. 1) [21,22]. Bleeding after CH could derive from inadequate vascular pedicle ligation while in SH could derive from clips malposition so often more ligations with resorbable suture are needed. It is important to keep attention while putting stitches, due to possible hematoma formation risk.

Perianal hematoma and external hemorrhoidal trombosis are reported only after SH (p-value < 0.05) with local pain presence, foreign body sensation, rectal tenesmus, sense of incomplete and hardly evacuation. All cases were treated with conservative therapy and solved in 4-5 weeks.

TABLE I - *Complications after surgery between two groups.*

Complications after surgery	CH (n241)	SH (n207)	p-value
Immediate complications (7 days)			
No pain	12 (5%)	27 (13%)	0.01*
Moderate pain	137 (56.8%)	118 (57%)	0.98
Significant pain	83 (34.4%)	59 (28.5%)	0.39
Intolerable pain	9 (3.7%)	3 (1.4%)	0.31
Bleeding	6 (2.5%)	12 (5.8%)	0.20
Incontinence to flatus	65 (27%)	57 (27.5%)	0.96
Urinary retention	12 (5%)	11 (5.3%)	0.96
Fever	26 (10.8%)	6 (2.9%)	0.0052**
External Thrombosis	/	10 (4.8%)	0.0025**
Anal Hematoma	/	9 (4.3%)	0.0046**
Early complications (within 45 days)			
No pain	85 (35.3%)	74 (35.7%)	0.79
Moderate pain	108 (48.8%)	133 (64.3%)	0.65
Significant pain	8 (3.3%)	/	0.0301*
Soiling	7 (2.9%)	13 (6.3%)	0.22
Incontinence to flatus	17 (7.1%)	16 (7.7%)	0.9346
Anal incontinence	/	2 (1%)	0.312
Fever	6 (2.5%)	3 (1.4%)	0.7105
Anorectal abscess	6 (2.5%)	3 (1-4%)	0.7105
External Thrombosis	/	5 (2.4%)	0.0527
Anal Hematoma	/	7 (3.4%)	0.0158*
Burning sensation / perianal itching	2 (0.8%)	8 (3.9%)	0.0936
Prolapse	/	6 (2.9%)	0.0289*
Stenosis	3 (1.2%)	3 (1-4%)	0.97
Recurrence	/	4 (1-9%)	0.0957
Late complications (after 45 days)			
Burning sensation / perianal itching	1 (0.4%)	7 (3.4%)	0.0569
Prolapse	2 (0.8%)	7 (3.4%)	0.1554
Stenosis	8 (3.3%)	7 (3.4%)	0.9986
Recurrence	/	4 (1.9%)	0.8336
Distant recurrence after telephone contact	3/190(1.6%)	3/167(1.8%)	
SATISFACTION	190/241	167/207	p- value
High satisfaction +2	161 (84.7%)	151 (90.4%)	p-0.0649
Moderate satisfaction +1	13 (6.8%)	15 (9%)	p > 0.05
No satisfaction 0	16 (8.5%)	1 (0.6%)	p > 0.05

Hemorrhoidal prolapse is more frequently observed after SH (p-value < 0.05); this complication appears even after first 45 postoperative days. According with some Authors in Literature, the prolapse incidence after SH is higher in patients with 4th grade hemorrhoids [23.25]. In all these cases a reintervention was needed. According to Ravo's study and others American works, hemorrhoids recidivist is more frequent after SH [21]. This data is confirmed in our study but with lower percentage (1.9%) mainly linked to accurate patients' hemorrhoids grade selection; in fact during our decennial experience we left CH for 4th degree.

Satisfaction level at the end of follow-up is mainly related to pain presence and grade in immediate postoperative period and to late complications persistence. In our experience there are no statistically significant differences between CH and SH despite better compliance with SH.

Conclusions

Often the gold standard in the treatment of hemorrhoids is not related to disease presence or grade, but to their symptoms and complications. A right nosologic study allows targeted surgical therapy. First and second hemorrhoids grade management need a right life style education and medical therapy [1]. Rubber band ligation is the gold standard for mild grade of hemorrhoids. Haemorrhoidal Artery Ligation Operation is a new technique still under valuation in haemorrhoids at 3rd and 4th degree. Open or closed haemorrhoidectomy is the gold standard in III and IV grade patients. Conventional hemorrhoidectomy is safe and with good outcomes but is feared due to the incidence of pain; we obtain high level of satisfaction with same technical expedients like local anaesthetic infiltration at the end of surgical pro-

cedure. In presence of IV grade of haemorrhoids with chronic irritation, inflammation, sclerosis phenomena and epidermoid metaplasia Milligan- Morgan technique represents the best surgical choice [3,5,13,19,22] also in our opinion. In case of wide excisions CH may be integrate with the suture of surgical site (Ferguson's technique) [26-28].
Stapled Hemorrhoidectomy is more painless then CH in first postoperative period and related to a better compliance. Nevertheless there is an increased rate of bleeding, residual prolapse and long term recidivists and consequent possible reintervention. In our opinion SH is the gold standard in case of III grade hemorrhoids with mucosal prolapse presence.
Finally every available techniques have their validity, but surgeon's experience and judgment is essential.
Only surgical technique accuracy and right surgical indication can guarantee better outcomes.

Riassunto

L'interesse riguardo le emorroidi è in rapporto alla loro elevate incidenza nella popolazione ed I costi sociali elevate connessi con il loro trattamento. In letteratura si trovano molti studi comparativi per definire uno standard per il trattamento ideale della malattia emorroidaria. Il trattamento chirurgico radicale rappresenta la unica opzione terapeutica nei casi al III ed al IV stadio. Le tecniche chirurgiche sono classificate come aperte, chiuse (CH) e con stapler (SH).
Si riporta qui una esperienza decennale con il trattamento chirurgico con particolare attenzione nei confronti delle complicanze precoci, intermedie e tardive, il grado di soddisfazione dei pazienti per ogni singola procedura terapeutica adottata.
Lo studio riguarda 448 pazienti ricoverati dal 1gennaio al 31 dicembre 2008, di cui 241 sottoposti al trattamento tradizionale di chirurgia aperta o chiusa e 207 con la tecnica con stapler secondo Longo, comprendendo solo i pazienti con emorroidi sintomatiche al III o IV stadio.
Come risultato non sono state osservate differenze tra la chirurgia tradizionale e quella con stapler riguardo i giorni di ricovero e la durata dell'intervento. Il dolore ha rappresentato la più frequente complicanza precoce con una differenza statistica significativa a favore della SH.
Si sono ottenuti buoni risultati nel gruppo di CH risparmiando l'anoderma e con l'infiltrazione anestetica perianale a fine intervento. In tutti casi il grado il trattamento del dolore è stato ottenuto soltanto con i farmaci analgesici correnti. Si è anche osservato che l'entità del dolore influenza il risultato del trattamento chirurgico. In nessun caso di entrambi i gruppi si è osservata l'insorgenza di dolore cronico.
Il sanguinamento ha rappresentato un'altra significativa complicazione precoce, in particolare dopo SH, con due casi per cui è stato effettuato un reintervento immediato e due casi che hanno richiesto delle emotrasfusioni.
Soltanto nel gruppo SH si sono avuto 5 casi di trombosi delle emorroidi esterne e 7 ematomi perianali, tutti risolti con terapia medica.
Non vi sono state differenze statistiche tra i due gruppi per ciò che riguarda febbre, incontinenza ai gas,ritenzione urinaria incontinenza fecale, substenosi e bruciori. Non è stato osservato nessun caso di stenosi anale.
Tra le complicanze tardive di più frequente osservazione si sono osservati il prolasso rettale e la recidiva emorroidaria, specialmente dopo SH.
Questa esperienza conferma la validità di entrambe le tecniche, CH ed SH. Gli insuccessi possono essere posti in relazione ad errori di indicazione o di esecuzione chirurgica. È chiaro che la procedura tradizionale è più invasiva e lievemente più dolorosa nell'immediato periodo postoperatorio che non la tecnica con stapler, che da parte sua è più costosa e presenta maggiori complicazioni. L'alto rischio di possibili complicanze post-chirurgiche precoci ed immediate richiede, nell'opinione degli autori, una degenza postoperatoria di almeno 24 ore.
La tecnica con stapler va considerata come il gold standard per le emorroidi di III grado con prolasso mucoso, mentre la chirurgia tradizionale va adottata per le emorroidi di IV grado.
Per essere convalidata la tecnica della legatura delle arterie emorroidali (HALO) per le emorroidi di III e IV grado richiede ulteriori studi.

References

1. Faccini M, Zuccon W, Caputo P, Gavezzoli D, Manelli A, Bonandrini L: *Malattia emorroidaria: inquadramento epidemiologico e correlazione con la stipsi cronica.* Ann Ital Chir, 2001; 72:337-40.

2. Zanghì G, Catalano F, Zanghì A, Gangi S, Furci M, Basile G, Benfatto G, Basile F: *Trattamento della malattia emorroidaria con suturatrice meccanica circolare.* Ann Ital Chir, 2003; 74(1); 63-66.

3. Cheetham MJ, Phillips RK: *Evidence-based practice in haemorrhoidectomy*. Colorectal Dis, 2001; 3:126-34.

4. Nisar PJ, Acheson AG, Neal KR, Scholefield JH: *Stapled hemorrhoidopexy compared with conventional hemorrhoidectomy: Systematic review of randomized, controlled trials*. Dis Colon Rectum, 2004; 47:1837-845.

5. Ortiz H: *Stapled hemorrhoidopexy versus Milligan-Morgan hemorrhoidectomy*. Ann Surg, 2007; 245(1):155-56.

6. Longo A: *Trattamento della malattia emorroidaria mediante correzione del prolasso mucoso con suturatrice circolare. Tecnica originale*. UCP News, 1999; 3:14-16.

7. Boccasanta P, Capretti PG, Venturi M, Cioffi U, De Simone M, Salamina G, Contessini-Avesani E, Peracchia A: *Randomised controlled trial between stapled circumferential mucosectomy and conventional circular hemorrhoidectomy in advanced hemorrhoids with external mucosal prolapse*. Am J Surg, 2001; 182(1):64-68.

8. Shalaby R, Desoky A: *Randomized clinical trial of stapled versus Milligan-Morgan haemorrhoidectomy*. Br J Surg, 2001; 88(8):1049-53.

9. *Randomized controlled trial to compare the early and mid-term results of stapled versus open hemorrhoidectomy*. Am J Surg, 2005; 189(1):56-60.

10. Abbasakoor F, Nelson M, Patel B, Morgan AR, Carr ND, Woodward A, et al.: *Linear stapled haemorrhoidectomy :An alternative to standard haemorrhoidectomy?* Colorectal Dis, 2000; 2:22-25.

11. Khalil KH, O'Bichere A, Sellu D: *Randomized clinical trial of sutured versus stapled closed haemorrhoidectomy*. Br J Surg, 2000; 87:1352-355.

12. Lloyd D, Ho HS, Seow-Chen F: *Modified Longo's hemorrhoidectomy*. Dis Colon Rectum, 2002; 45(3):416-17. Review.

13. TironeA, Vuolo G, Gaggelli I, Francioli N , D'Onofrio P, Quarta S, Verre L: *Emorroidectomia con tecnica THD (Transanal Haemorroidal Dearterialization). Nostra esperienza.* Ann Ital Chir, 2010; 81:301-14.

14. Gravié JF, Lehur PA, Huten N, Papillon M, Fantoli M, Descottes B, Pessaux P, Arnaud JP: *Stapled hemorrhoidopexy versus milligan-morgan hemorrhoidectomy: A prospective, randomized, multicenter trial with 2-year postoperative follow up*. Ann Surg, 2005; 242(1):29-35.

15. Rowsell M, Bello M, Hemingway DM. *Circumferential mucosectomy (stapled haemorrhoidectomy) versus conventional haemorrhoidectomy: randomised controlled trial*. Lancet, 2000; 355(9206):779-81.

16. Ganio E, Altomare DF, Gabrielli F, et al.: *Prospective randomized multicentre trial comparing stapled with open haemorrhoidectomy.* Br J Surg, 2001; 88:669-74

17. Singer MA, Cintron JR, Fleshman JW, Chaudhry V, Birnbaum EH, Read TE, Spitz JS, Abcarian H: *Early experience with stapled hemorrhoidectomy in the United States*. Dis Colon Rectum, 2002; 45(3):360-67; discussion 367-69.

18. Falsetto A, De Pascale V, Della Corte M, Castaldo N, Canero A, Cennamo A: *Diathermy haemorrhoidectomy: Reasons for a therapeutic choice.* Ann Ital Chir, 2006; 77(2):155-60.

19. Gentile M, A. Cricrì AM, D'Antonio D, Bucci L: *Emorroidectomia con stapler VS. emorroidectomia tradizionale: Risultati comparativi tra due gruppi di pazienti.* Ann Ital Chir, 2002; 73:181-86.

20. Corman ML,Graviè JF, Hager I, Loudon MA, Mascagni D,Nyström PO, Seow-Chen F, Abcarian H, Marcello P, Weiss E, Longo A: *Stapled haemorrhoidopexy: A consensus position paper by an international working party - indications, contra-indications and technique*. Colorectal Dis, 2003:(4):304-10. Review.

21. Ravo B, Amato A, Bianco V, Boccasanta P, Bottini C, Carriero A, Milito G, Dodi G, Mascagni D, Orsini S, Pietroletti R, Ripetti V, Tagariello GB: *Complications after stapled hemorrhoidectomy: can they be prevented?* Tech Coloproctol, 2002; 6(2):83-85.

22. Bove A, Bongarzoni G, Palone G, Chiarini S, Calisesi EM, Corbellini L: *Effective treatment of haemorrhoids: early complication and late results after 150 consecutive stapled haemorrhoidectomies*. Ann Ital Chir, 2009; 80:299-304.

23. Pescatori M, Orsini G, Tegon G, Vasopollo L: *Emorroidopessi con stapler: Note critiche sullo stato dell'arte*. Ann Ital Chir, 2005; 76(1):71-76.

24. Ortiz H, Marzo J, Armendariz P: *Randomized clinical trial of stapled haemorrhoidopexy versus conventional diathermy haemorrhoidectomy*. Br J Surg, 2002; 89(11):1376-381.

25. Lai HJ, Jao SW, Su CC, Lee MC, Kang JC: *Stapled hemorrhoidectomy versus conventional excision hemorrhoidectomy for acute hemorrhoidal crisis*. J Gastrointest Surg, 2007; 11(12):1654-661. Epub 2007.

26. *Stapled haemorrhoidopexy for the treatment of haemorrhoids: A systematic review*. Colorectal Dis, 2008.

27. Senagore AJ, Singer M, Abcarian H, et al.: *Procedure for Prolapse and Hemorrhoids (PPH) Multicenter Study Group: A prospective, randomized, controlled multicenter trial comparing stapled hemorrhoidopexy and Ferguson hemorrhoidectomy: Perioperative and one-year results.* Dis Colon Rectum, 2004; 47:1824-836.

28. Ortiz H, Marzo J, Armendariz P, et al.: *Stapled hemorrhoidopexy vs. diathermy excision for fourth-degree hemorrhoids: A randomized, clinical trial and review of the literature*. Dis Colon Rectum, 2005; 48:809-15.

29. Rockwood TH, Church JM, Fleshman JW, Kane RL, Mavrantonis C, Thorson AG, Wexner SD, Bliss D, Lowry AC: *Patient and surgeon ranking of the severity of symptoms associated with fecal incontinence: The fecal incontinence severity index*. Dis Colon Rectum, 1999; 42 (12):1525-532.