

The non-surgical management for hemorrhoidal disease. A systematic review

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SUMMARY: The non-surgical management for hemorrhoidal disease. A systematic review.

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The non-surgical treatments for hemorrhoids are cost and time-saving techniques usually performed in patients suffering early hemorrhoidal disease. The most used are rubber band ligation (RBL), injection sclerotherapy (IS), and infrared coagulation (IRC). We performed a systematic review in order to evaluate: do these procedures really help to avoid further more aggressive treatments? What are the common harms? What are the rare harms? How many recurrences the-

re are? A total of 21 RCTs were included in this review: 12 on RBL, 4 on IRC and 5 on IS. In RBL bleeding stops in up to 90% and III degree hemorrhoids improves in 78%-83.8%. IV degree prolapse should have a more invasive treatment. The commonest complications are bleeding and pain (8-80%). IRC related improvement is 78%, 51% and 22% for I, II and III degree. Post-operative pain occurs in 15-100% and post-operative bleeding ranges from 15% to 44%. Recurrence rate is 13% at a three months follow-up. IS brings to the resolution of prolapse in 90%-100% of II degree and allows good results for III degree even if reported only by case series. The post-procedural pain is 36%-49%. Bleeding is a very rare harm.

Even if not definitive, these treatments could be an alternative for mild symptomatic patients after a clear explanation of recurrence rates and possible complications.

KEY WORDS: Hemorrhoid ligation - Hemorrhoid sclerotherapy - Hemorrhoid infrared coagulation - Hemorrhoid complications - Review - Outpatient treatment.

Introduction

Rationale. The non-surgical treatments for hemorrhoids include rubber band ligation (RBL), injection sclerotherapy (IS), infrared coagulation (IRC), anal stretch, cryosurgery, laser hemorrhoidectomy. These treatments are usually performed in outpatient clinics without anesthesia, so reducing the costs related to hospital stay, operation-theatre and anesthesia; moreover, these techniques are time-saving and allow preserving patients' working days. These procedures have found a large use in patients suffering bleeding and prolapse caused by early hemorrhoidal stages that did not found an improvement with conservative therapy.

Objectives. The aim of this review is to provide a framework to select the best procedure for different patients in order to minimize complications and to obtain the cure for this widespread social problem. Among the treatments RBL, IS and IRC are the most utilized and were analyzed. It was analyzed: 1) Does these procedures help? 2) What are the common harms? 3) What are the rare harms? 4) How many are the recurrences?

Methods

This systematic review was undertaken in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (2).

Eligibility criteria. Studies on patient complaining of bleeding or prolapse due to hemorrhoidal disease managed with RBL, IS and IRC were collected. The hemorrhoidal degrees and the presence of bleeding or prolapses were analyzed. The well-defined treatment modality and the symptoms resolution as outcome measures were

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checked in the articles. The follow-up period and the recurrences of disease were considered. The literature search comprised all the inherent published original papers from 2000 to December 2014; also abstract were included. No language selection was done. Exclusion criteria were hemorrhoidal degree not elucidated, resolution of symptoms not clearly established. A PRISMA flow diagram shows the selection process (Flow-diagram) (1).

Information source. Original papers were identified by search on PubMed/MEDLINE and the Cochrane library.

Search strategy. Search terms used were: “hemorrhoid ligation”, “hemorrhoid sclerotherapy”, “hemorrhoid infrared coagulation”, “hemorrhoid complication”.

Study records

Data management. An electronic record with an Excel framework was done including sample sizes and initial numbers.

Selection process. Articles were searched by two independent reviewers for initial screening and for eligibility to be included in the review. Only RCT were included.

Data collection process. Data were extracted in a pilot form and then selected according to the missing or superfluous ones. Disagreements among reviewers were solved by discussion.

Data items. Number of patients, patient demographic data, hemorrhoidal degree according to Goligher’s classification, bleeding or prolapse as main symptoms were the main variables required as initial data. Bleeding and pain resolution, the occurrence of post-treatment complications and the recurrence rate at follow-

up were important data. Finally it was collected a series of severe reported complications that, even if only occasionally occur, could be really serious and of difficult management.

Outcomes and prioritization. The percentage of improvement or resolution of bleeding and prolapse, the occurrence of post-operative complications such as pain and bleeding and the recurrences at follow-up were the main measured outcomes.

Risk of bias in individual studies. Some reports reported grouped hemorrhoidal degrees; this can confound results related to singular degrees. Loss of patient and small periods of follow-up and the different outcome measures can be sort of bias at the outcome level.

Data synthesis. Data were collected separately for each treatment and synthesized using median and cumulative percentages. Due to the heterogeneity of data no meta-analysis was performed.

Results

A total of 21 articles were included in this review: 12 articles on RBL, 4 articles on IRC and 5 articles on IS.

RBL (2-13): The average age of patients managed with RBL was 44 (Sd 20). 63% of patients were males. Exclusion criteria were evaluated to assess the feasibility of the technique; the most frequent reported ones were: hemorrhoids grade I and IV, thrombosed hemorrhoids, ano-rectal conditions as fissures, fistulas and abscesses, colitis, colorectal malignancies, pregnancy, immunodeficiency, DM, coagulation disorders.

Data about hemorrhoidal degree, number of piles ligated per session, number of bands placed, number of sessions and initial symptoms (pain and bleeding) are

TABLE 1 - DEMOGRAPHICAL DATA (HEMORROIDAL DEGREE, SYMPTOMS) AND TECHNICAL DATA (NUMBER OF PILES LIGATED PER SESSION, NUMBER OF BANDS POSITIONED PER PILE, NUMBER OF SESSIONS, DAYS WAITED BETWEEN SESSIONS).

Author	Year	Type of study	n. Pz	Degree	Symptoms				Bleeding	Prolapse	Piles x session	n. bands	One sess	Two sess	Days between sess.
					I	II	III	IV							
Awad	2012	RCT	60	II-IV	0	27	31	2				3	90%	8,30%	
Azizi	2010	RCT	50	n.r.	n.r.	n.r.	n.r.	n.r.	94%	24%	2,6 +0,5	1-2			
Jutabha	2009	RCT	21	II-III	0	9	12	0	100%	50%				100%	
Ricci	2008	RCT	23	I-III	4	14	5	0	69,9%		1-2		82,60%	17,40%	
Cazemier	2007	RCT	19	I-III	15	4	0	0				4(2-10)	68,50%	26,30%	42
Ramzisham	2005	RCT	50	II-III	n.r.	n.r.	n.r.	n.r.			2,42				
Wehrmann	2004	RCT	50	II-III	0	27	23	0	100%	18 %		3,7+1,4(1-7)	16%	80%	21
Kanellos	2003	RCT	81	n.r.	n.r.	n.r.	n.r.	n.r.	100%	94%	1		72%	52%	

TABLE 2 - EFFECTIVENESS OF RBL FOR BLEEDING AND PROLAPSE RESOLUTION.

Author	Study	n. Pz	I	II	III	IV	no bleeding	improved II	improved III	improved IV	subjective impr.
Mushtaq	RCT	50		36	14		70%	93%	78%		84,00%
Awad	RCT	60		27	31	2		100%	83,8%	50%	73,30%
Jutabha	RCT	21		9	12		92%	92%			
Ricci	RCT	53	32	14	5		90%	82%			73,90%
Wehrmann	RCT	114	15	54	45		95%	72%			
Gupta	RCT	54		54			92,60%	92%			

TABLE 3 - RBL RELATED COMPLICATIONS.

Author	Study	Degree	N. Pz	Complications		
				Pain	Bleeding	Severe pain
Awad	RCT	II-IV	60		10%	
Zaher	RCT	II-IV	13	38,50%		
Azizi	RCT	I-III	50	28%	36%	
Jutabha	RCT	II-III	21	8%		
Kayhan	RCT	II	30	60%		
Ricci	RCT	I-III	23	39%	34,80%	20%
Marques	RCT	II-III	47	80%	32%	
Ramzisham	RCT	II-III	50	28%	50%	
Wehrmann	RCT	II-III	50	25%	3,50%	
Gupta	RCT	II	100		12,90%	
Kanellos	RCT	II	81	7,40%	1,20%	3,70%

shown in Table 1. The reported number of sessions is generally one, occasionally two with a period of 4 week between sessions. Ramrhizar and Cazemier, in their RCTs, insert 2 or 3, until 6, bands per session (11-12); Fukuda proposes in a case-series that until 8 bands for session can be positioned (20).

The prevalent post-operative complications are bleeding and pain. Post-operative pain ranges from 8% to 80 % in different RCTs (8-10, 12-14, 22-24). Post-operative bleeding is reported in up to 50% of patients in the RCT proposed by Ramzisham, however lower rates are presented in others RCTs (11). The reported incidences in different studies are showed in Table 3.

The overall subjective improvement ranges from 73% to 84%. The effectiveness of the treatment for cure bleeding and prolapse is showed in Table 2. Bleeding stop is reported up to 90% of patients in 4 RCTs (9-10, 13, 25). Improvement in II degree hemorrhoids is shown in 93% of patients in the RCTs of Ricci, Gupta and Juthaba (9-10, 25) and in 100% in the RCT proposed by Awad (7). III degree hemorrhoidal improvement is shown in 78% and 83,8% of patients in two RCTs (7-51). Khan reported a 96% of symptoms-free patients with III de-

gree hemorrhoids (47). Mushtaq concluded in an RCT comparing RBL and hemorrhoidectomy that RBL is good for II degree while not effective for III degree hemorrhoidal prolapse (51). Azizi found a 94% of success for RBL in I-III degree (8). Awad in an RCT reports 50% of improvement in IV degree prolapsed hemorrhoids (7).

Recurrences of bleeding and prolapse at follow-up occur in 10%-18% (7, 9, 11, 25) and in 2.2% of patients (25), respectively. Kanellos reported higher percentages of minor complications (46% of recurrence for bleeding and 34% for prolapses in II degree hemorrhoids) (14). Recurrence rates following RBL are shown in Table 4.

IRC (14-17): The average age of patient managed with IRC in the analyzed studies was 45. 56.6% of patients were males. Exclusion criteria were evaluated to assess the feasibility of the technique; the most frequent ones are: pregnancy, acute hemorrhoidal attack < 6 months, grade III-IV, colon and anal canal diseases, pelvic radiation, anticoagulant, antiplatelet or NSAIDs therapy, previous hemorrhoidal treatments; renal, cardiac, pulmonary diseases; heart mechanical valve; portal hypertension; immunosuppression.

The safety of the technique was evaluated through the

TABLE 4 - RECURRENCES AFTER RBL OF BLEEDING AND PROLAPSE AT FOLLOW-UP.

Author	Year	Study	Degree	N. Pz	Follow up (months)	Recurrences	
						Bleeding	Prolapse
Awad	2012	RCT	II-IV	60	12	18,30%	
Jutabha	2009	RCT	II-III	21	12	10%	
Cazemier	2007	RCT	I-III	19	12	10,50%	
Gupta	2003	RCT	II	46	12	13%	2,20%
Kanellos	2003	RCT	II	83	6	46%	34%

TABLE 5 - EFFECTIVENESS OF IRC.

Author	Study	Degree	I	II	III	IV	N. Pz	No bleeding I	No bleeding II	No bleeding III	Subjective moderate improvement
Dimitroulopoulos 2005	RCT	I-III	31,6%	48,7%	19,7%		117	78,4%(29)	51,6%(32)	22,2%(4)	
Gupta 2003	RCT	II		46			46				
Ahmad 2013	RCT	I-II	48	81			129				81,00%
Marques 2006	RCT	I-II					47				93,00%

TABLE 6 - COMPLICATIONS OF IRC.

Author	Study	N. Pz	Grade	I	II	III	IV	Piles x session	Complications	
									Pain	Bleeding
Dimitroulopoulos 2005	RCT	117	I-III	31,6%	48,7%	19,7%			48,7% (111)	44,40%
Gupta 2003	RCT	46	II		46			All	100%	15,20%
Ahmad 2013	RCT	129	I-II	48	81				16,3% (21)	
Marques 2006	RCT	47	I-II							17%

complication rates; pain and bleeding were the prevalent; the incidence rates reported are showed in Table 6. Dimitroulopoulos in a RCT reported 48.7% of post-operative pain; in Gupta's RCT 100% of patient complained pain (32, 34). In contrast, Ahmad reported only 16% of pain rates (35). Post-operative bleeding ranged from 44% in Dimitroulopoulos' to 15% in Gupta's RCTs (32, 34).

We evaluated the effectiveness in bleeding and prolapses control for different degrees of hemorrhoids; results are shown in Table 5. Only one RCT evaluated the percentages of improvement for different hemorrhoidal degrees reporting an improvement in 78%, 51% and 22% for I, II and III hemorrhoidal degrees respectively

(32). However, two RCTs reported a subjective moderate improvement in 81% and 93% of patients with I and II degrees of hemorrhoids (24, 35). Juthaba reported a success rate of 62 % for IRC compared to 92% for RBL, while Ricci reported an equal success rate with lesser pain in the IRC group (9-10).

Two RCTs reported 13% of recurrence rates for bleeding in I-II degrees in a mean follow-up period of three months (32, 34). Recurrences after IRC treatment are shown in Table 7.

IS (18-22): Demographic data and symptoms are showed in Table 8. Exclusion criteria were evaluated in the several series to assess the feasibility of the technique; the reported ones are: acute inflammation in perianal re-

TABLE 7 - RECURRENCES OF BLEEDING AND PROLAPSE AFTER IRC.

Author	Year	Study	N. Pz	Degree	I	II	III	IV	Follow up	Recurrence	
										bleeding	prolapse
Dimitroulopoulos	2005	RCT	117	I-II-III	31,60%	48,70%	19,70%		3 m	13,8%	
Gupta	2003	RCT	46	II		100%				13%	

TABLE 8 - DEMOGRAPHICAL DATA (HEMORROIDAL DEGREE, SYMPTOMS) AND TECHNICAL DATA (TYPE OF SCLEROSANT AGENT).

Author	Year	Study	Scleroting agent	N. Pz	Degree	I	II	III	IV	Symptoms	
										Prolapse	Bleeding
Takano	2006	RCT	OC-108 aluminium potassium sulphate	105	II-IV		5	60	15	100% (80)	51% (41)
Yuksel	2008	RCT	3% polidocanol	62	I-II	8	54				87% (54)
Porret	2000	RCT	5% phenol oil	13	I-II	3	10			1	100%
Moser	2013	RCT	3% polidocanol foam	66	I	66					
Moser	2013	RCT	3% polidocanol	64	I	64					
Khan	2006	RCT	5% phenol in almond oil	102							

TABLE 9 - EFFECTIVENESS OF IS.

Author	Year	Study	N. Pz	Degree	I	II	III	IV	No bleeding	No prolapse II	No prolapse III	Improved prolapse III	Improved prolapse IV	Subjective excellent improvement	Subjective moderate improvement	No improvement
Yuksel	2008	RCT	62	I-II	8	54								51,6% (31)	20% (12)	28,3% (17)
Moser	2013	RCT	64	I	64				69%							

TABLE 10 - TECHNICAL DATA AND COMPLICATIONS OF IS.

Author	Study	Degree	I	II	III	IV	N. Pz	Piles per session	ml per pile	ml per session	Complications	
											Pain	Bleeding
Takano 2006	RCT	II-IV	5	60	15	105	all	9-13	30+7	49%(40)	6%(5)	
Moser 2013	RCT	I	66			66			6	24%		
Moser 2013	RCT	I	64			64			2	36%	0,90%	

gion, hemorrhoidal thrombosis, acute not reducible hemorrhoids, previous anal surgery, previous sclerotherapies; proctoceles; III e IV degrees, fissures, fistulas, abscesses, proctitis and other proctological conditions, colorectal neoplasia, faecal incontinence; cardiac, hepatic, renal and hematological diseases; pregnant or nursing mothers; hypersensitivity to local anesthetics; asthma; allergic predisposition; hypercoagulability, thrombophilia, anticoagulant therapy; HBV, HCV; Crohn's disease or UC, DM.

The safety of the technique was evaluated looking at complication rates, including bleeding and pain; data are showed in Table 10. Patients submitted to IS have a relatively low occurrence of post-procedural pain: 36% in I degree is reported by Moser, 49% is reported by Takano (36, 41).

We evaluated the effectiveness in bleeding and prolapses control to give an indication regarding treatment benefits for different degrees of hemorrhoids; data are shown in Table 9. An RCT reported resolution of bleed-

TABLE 11 - RECURRENCES OF IS.

Author	Study	Degree	I	II	III	IV	n. Pz	Follow up in months	Recurrence bleeding	Recurrence prolapse
Takano	RCT	II-III-IV	5	60	15		105	12		16%
Bulent	RCT	I-II	8	54			62	24	29,00%	
Moser	RCT	I	66				66	3	1,5%	
Moser	RCT	I	64				64	3	2,00%	

ding in 69% to 88% of I degree of hemorrhoids and prolapses' resolution in II degree in 90%-100% of patients (36, 39, 49). A subjective excellent improvement is reported in 80% of patients with I degree by Moser (41).

Recurrence rates are shown in Table 11.

Discussion

RBL - RBL, as ligation of internal hemorrhoids, was first described by Bleisdell in 1958 and then modified by Barron in 1963. This procedure is performed as an outpatient approach and consists in positioning elastic bands above the dentate line to strangulate the piles leaving an area where inflammation fixes the mucosa to the sub-mucosa preventing subsequent development of new hemorrhoidal tissue. This technique is the most used non-surgical treatment for patient complaining of II or III degree hemorrhoids, according to the Goligher's classification.

In the original technique, Barron proposed to treat only one cushion per session; however actually many groups report different management. Ramrhizar and Caze-mier, in their RCTs, insert 2 or 3, until 6, bands per session (11, 12); Fukuda proposes in a case-series that until 8 bands for session can be positioned (20). It seems that, in contrast to the original technique, more than one band can be placed to reduce the number of sessions, even if no definitive data on postoperative pain can be found. The reported number of sessions is generally one, occasionally two with a period of 4 week between sessions.

Over the years some technical innovations as endoscopic ligation and retro-vision endoscopic ligation have been proposed. These procedures allow a better visualization of the piles and dentate line and a photographic record but are more expensive, are more time consuming and can cause more pain (13, 21).

RBL seems effective for bleeding and prolapse. Data regarding I or IV degree treatment and its efficacy are occasionally reported. Awad in an RCT reports 50 % of improvement in IV degree prolapsed hemorrhoids (7). The overall subjective improvement ranges from 73% to 84%.

The common harms are bleeding and pain. Post-operative pain ranges from 8% to 80 % in different RCTs

(8-10, 12-14, 22-24). Post-operative bleeding is reported in up to 50% of patients in the RCT proposed by Ramzisham, however lower rates are presented in others RCTs (Table 2) (11). Recurrences of bleeding and prolapse at follow-up occur respectively in 10%-18% (7, 9, 11, 25) and in 2.2% of patients (25); Kanellos reported higher percentages of minor complications (46% of recurrence for bleeding and 34% for prolapses in II degree hemorrhoids) (14). Zaher investigated the use of RBL in patients with portal hypertension comparing it to hemorrhoidopexy, showing similar results in success rate, post-operative pain and bleeding, and recurrences; RBL seems a good treatment in these patients suffering internal hemorrhoids and without coagulation disorders (22). Forlini reported that patients assuming ASA, NSAIDs or Clopidogrel have to stop their intake before the procedure (4); in contrast Su-My does not suggest it (21). Patients treated with these drugs showed more perioperative bleeding in comparison with no assumption in the paper presented by Iyer (6). Whenever possible it appears safe to stop antiplatelet and anticoagulant therapy. Compared to Milligan-Morgan haemorrhoidectomy, RBL appears safe and effective in II and III degree symptomatic haemorrhoids (52). Moreover, RBL is associated with low rates of post-operative pain and complications (53).

IRC - Infrared coagulation consists in application of infrared waves to the tissue in order to obtain its necrosis. It can be considered an option for the initial management of I and II hemorrhoids degree. Only one RCT evaluated the percentages of improvement for different hemorrhoidal degrees reporting an improvement in 78%, 51% and 22% for I, II and III hemorrhoidal degrees respectively (32). However, two RCTs reported a subjective moderate improvement in 81% and 93% of patients with I and II degrees of hemorrhoids (24, 35). Juthaba reported a success rate of 62 % for IRC compared to 92% for RBL, while Ricci reported an equal success rate with lesser pain in the IRC group (9-10). Dimitroulopoulos in a RCT reported 48.7% of post-operative pain; in Gupta's RCT 100% of patient complained pain (32, 34). In contrast, Ahmad reported only 16% of pain rates (35). Post-operative bleeding ranged from 44% in Dimitroulopoulos' to 15% in Gupta's RCTs (32, 34). Two RCTs reported 13% of recurrence rates for bleeding in

I-II degrees in a mean follow-up period of three months (32, 34).

IS - Injection sclerotherapy, through the local infiltration with sclerosant agents, leads to the necrosis of hemorrhoidal tissue with scarring and subsequent fixation of mucosa to the submucosa (37). Many sclerosant agents had been used over time, among those the new ALTA (Aluminium sulphate and tannic acid) that induces a strong local inflammatory reaction resulting in fibrosis and a strong astringent effect on tissue, causing protein coagulation and the contraction of blood vessels, promoting finally sclerosis and adhesion of hemorrhoidal tissue. An RCT reported resolution of bleeding in 69% to 88% of I degree of hemorrhoids (36); while 3 case series showed an improvement of bleeding in 100% of II and III degrees hemorrhoids (38, 39, 49). 90%-100% of prolapses' resolution in II degree is reported in a RCT and two case series (36, 39, 49). Good results are shown also for III degree but data are reported only by case series. A prospective study showed an overall prolapses' improvement in 100% of patients (46), while Yano reported 52% of improvement of prolapse in III degree (43). Miyamoto and Tokunaka in their case series showed an improvement for IV degree, too (44, 49). However, the RCTs presented in literature are poor of data. A subjective excellent improvement is reported by Yuksel in 51% of patients with I and II degrees of hemorrhoids and in 80% of patients with I degree by Moser (37, 41). The only prospective study that sufficiently related about III and IV degrees revealed 70% of subjective moderate/excellent improvement. Patients submitted to IS have a relatively low occurrence of post-procedural pain: 36% in I degree is reported by Moser, 49% is reported by Takano (36, 41). Bleeding is a very rare harm. IS appears effective for treatment of II degree of hemorrhoids but more studies are needed to state its efficacy in other hemorrhoidal degrees.

Complications

Complications related to minimally invasive treatments for hemorrhoidal disease are usually mild and account mainly for bleeding and pain, as previously reported. The secondary hemorrhage occurs up to two weeks when the bands slough off the hemorrhoidal mucosa leaving an ulcer with a blood vessel at its base. However, some case-reports relate about life-threatening complications that should be considered prior to perform these treatments and in the control visits.

We reported the most significant rare complications to offer an analysis as complete as possible. Patel reported two cases of bleeding per rectum from ulcerative lesions at the site of band ligation 15 days after RBL; one patient needed resuscitation, while in the second an endoscopic hemostasis was performed. The author suggested that antiplatelet may have predisposed the patients

to massive bleeding (54). Massive gastrointestinal hemorrhage is reported 10 day after one RBL session in a patient assuming aspirin. A local examination did not found the location of the ooz, finally the inferior aspect of the superior hemorrhoidal artery was showed bleeding by a selective angiography and effective surgical hemostasis was done (55-56). Beattie reported two cases of life-threatening hemorrhage in patients taking clopidogrel. Hemorrhage was treated with a silastic irrigation catheter inserted into the anal canal inflated with 50 ml of water, achieving a good control (57). These reports suggested caution with patients taking antiplatelet agents.

A fatal perineal sepsis a week after a RBL is reported in a patient with severe anal pain, minctional difficulty and vomiting. Septic shock and a progressive necrotizing infection requiring a bed-side debridement income; finally patient died for cardiorespiratory collapse during the hospital stay. The author suggests in these cases an immediate diverting stoma and an aggressive debridement (58). Perineal sepsis should be suspected in patients presenting with urinary difficulty and perineal pain that usually occur two to seven days after treatment.

Pylephlebitis and pyogenic liver abscesses in a diabetic patient after RBL are reported. Sepsis following hemorrhoidal banding without local signs of infection should undergo evaluation for pylephlebitis and PLA. Caution against hemorrhoidal banding is warranted in immunocompromised patients in addition to adequate colonic preparation with an enema, while no evidence exists for antibiotic prophylaxis for RBL (59). Endocarditis in a patient with a ventricular septal defect has been reported by Tejjirian (60). Jaundice occurring six days after a phenol IS causing a chemical hepatitis self-controlled only after six month had been reported (61). Adult respiratory distress syndrome following IS with 5% phenol in almond oil requiring ventilator support had been reported (62). Perianal pain, pneumaturia, fecaluria or passage of urine per rectum can be associated to a recto-urethral fistula. A case, presented a week later a 5% phenol in almond oil IS, was treated with a suprapubic cystostomy and antibiotic therapy resolving in six week (63). This complication can be related to a deep injection or a large dose of sclerosant that may erode tissue planes. The need of bowel diversion and a contraindication to conservative management has been emphasized in case of fecaluria (64). Necrotizing fasciitis and retroperitoneal sepsis managed with a loop sigmoid diversion and a second look with a retroperitoneal debridement without recovery were reported for phenol IS. The author did not relate the complication to technical errors and advised to consider other treatment in place of IS for hemorrhoid therapy (65). Elram reported a case of anorectal necrosis occurred after two injections of 5% phenol, three week apart, requiring urgent abdominoperineal resection for recto-sigmoid necrosis (66). This

report underlines the need for a long interval between sessions. Schulte related about a case of fever and low abdominal pain following IS with a CT scan examination revealing edema of rectal wall and a colonoscopy depicting a longitudinal necrosis followed by a fulminant necrotic infection of the rectum with a severe septic shock treated by a Hartmann operation (67, 68). Abdominal compartment syndrome following IS was reported by Yang; a submucosa or muscular injection with thromboses of the venous plexus of the colon followed by extensive edema and exudate accumulation had been acclaimed as cause (69-73). Impotence was related by Bullock to a deep injection of sclerosant agents near to parasympathetic nerve fibers in the posterolateral aspect of the prostate gland (74).

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Conclusions

The minimally invasive procedures are alternatives to the traditional hemorrhoidectomy and hemorrhoidopexy for mild symptomatic patients complaining of early hemorrhoidal degrees. The resolution of bleeding and prolapse is reported with moderate/high success rates, lower than in surgical treatments. Reported follow-up are short. Pain and bleeding are the most reported post-operative complications but serious life-threatening ones had been described, also if rare. The recurrence rates are higher than conventional surgery but all these treatments can be repeated. Even if not definitive, these treatments can be proposed after a clear explanation of the recurrence rates and the possible complications.

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