

UCHSC Grand Rounds

5-16-11

CURRENT TREATMENT OF COMMON ANORECTAL DISORDERS

Common disorders

- Hemorrhoids
- Anal Fissure
- Pilonidal Disease
- Fistula in Ano

Anorectal evaluation (never forget!)

◎ COMPLETE History

- You **NEED** to ask every patient about continence
- Surgical history
- Bowel habits (frequency, consistency, laxative use)
- Cannot rely on prior exam or history

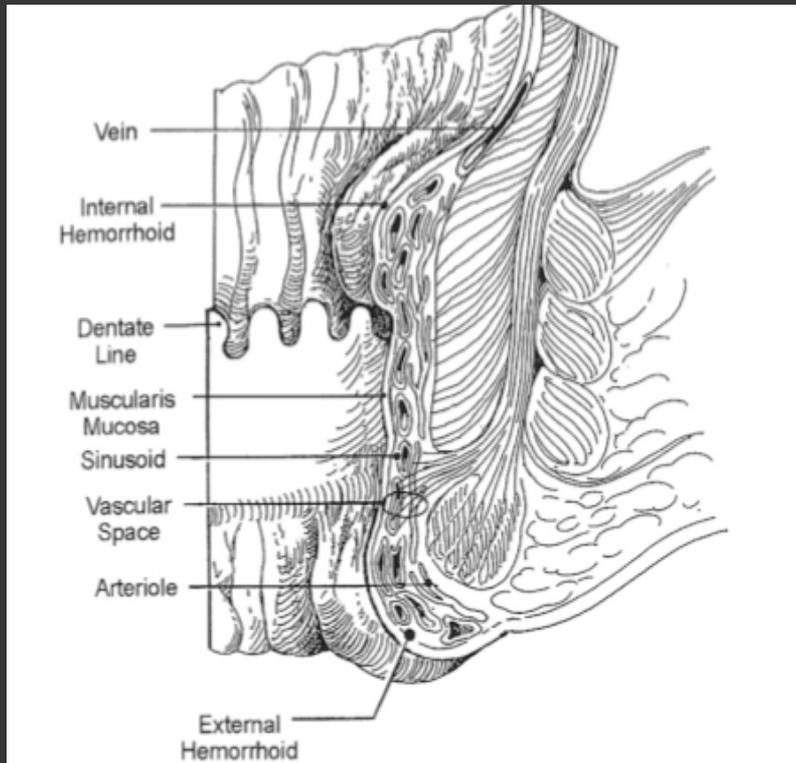
Physical exam

- Position: Prone vs Left lateral decubitus
- DRE (tone/squeeze pressure, masses, strictures, rectovaginal septum, prostate)
- Anoscopy
- Keep patient informed and comfortable
- Exam under anesthesia

CCFIS (Cleveland Clinic Fecal Incontinence Score)

- Sum of 5 parameters is determined that are scored on a scale from 0 (=absent) to 4 (daily) frequency of incontinence to gas, liquid, solid, of need to wear pad, and of lifestyle changes
- 0 to 20 scale (0= normal, 20= complete incontinence)

Hemorrhoids: Anatomy/Physiology



- “Sliding anal cushion theory”—Thompson
- Engorgement w/ straining makes downward displacement more likely
- Stretching of longitudinal muscle (of Treitz)

Anatomy/Physiology

- ⦿ What are the hemorrhoidal cushions?
 - Protect the underlying anal sphincters
 - Help with fine continence, cushions engorge with Valsalva and maintain closure of anal canal (almost 20% resting pressure)
- ⦿ Classic description of columns at LL, RA, RP
 - True in only 19% based on cadaver studies
 - Most have smaller accessory cushions between
- ⦿ Associated with straining (diarrhea *OR* constipation)

Hemorrhoidal Disease

- ◎ Classification based on relationship to dentate line
 - INTERNAL: Above dentate (columnar epithelium)
 - *Goligher* classification: I=bleed w/ defecation, II=bleed and prolapse, reduce spontaneously, III=manually reduced, IV=permanently prolapsed at anal verge
 - EXTERNAL: Below dentate (squamous epithelium), associated with skin tags--redundant skin from prior episodes of prolapse

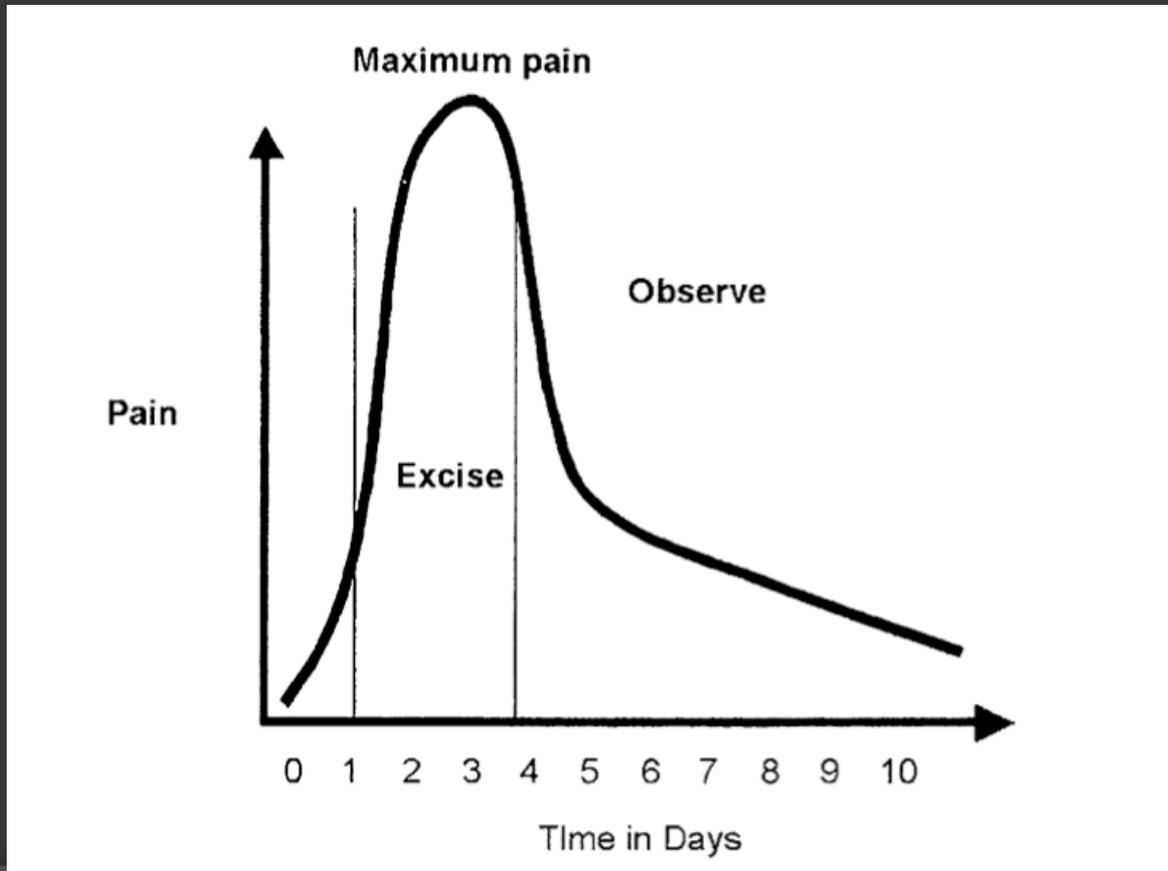
Acute Thrombosis

- ⦿ Thrombus excision vs. conservative therapy (sitz baths) based on timing and degree of pain
- ⦿ Better to leave wound edges open (less risk of re-thrombosis)



Acute Thrombosis

- Maximal pain typically peaks at about 48 hours



Chronic Disease: How to treat?

- ⊙ “Non-operative” procedures:
 - RBL, infrared photocoagulation, bipolar diathermy, direct current electrotherapy, sclerotherapy
- ⊙ Operative: excisional hemorrhoidectomy, DG-HAL, stapled hemorrhoidectomy, Ligasure™)
- ⊙ *Classification of hemorrhoids should be the guide--II-III (non-operative) vs. III-IV (operative)*

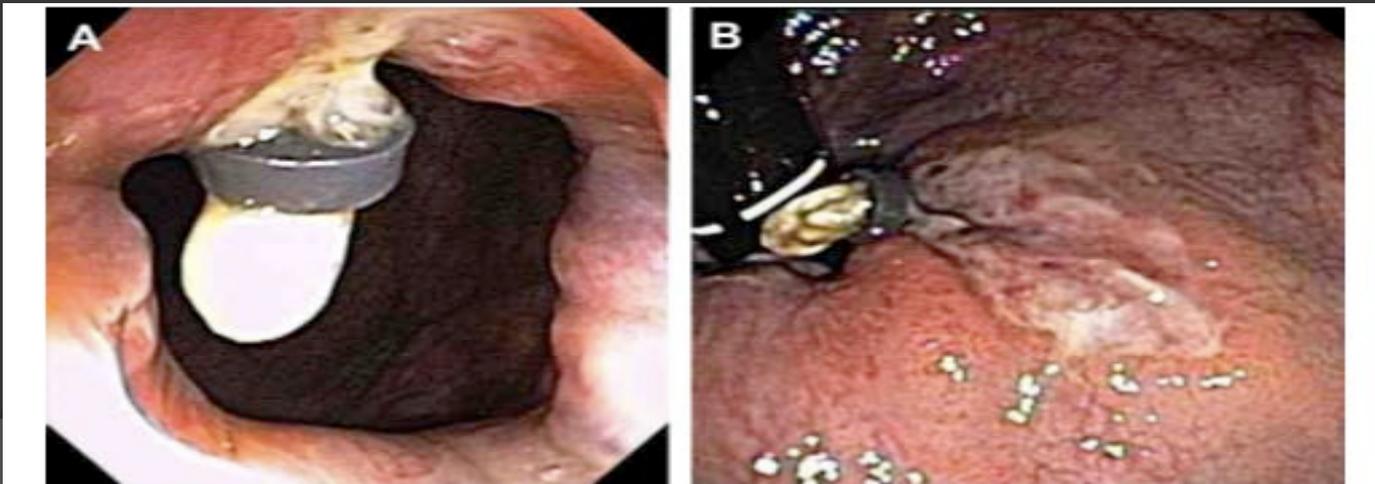
Rubber Band Ligation (RBL)

- Blaisdell (1958), modified by Barron (1963)
- Multiple areas can be ligated safely at one setting



Rubber Band Ligation (RBL)

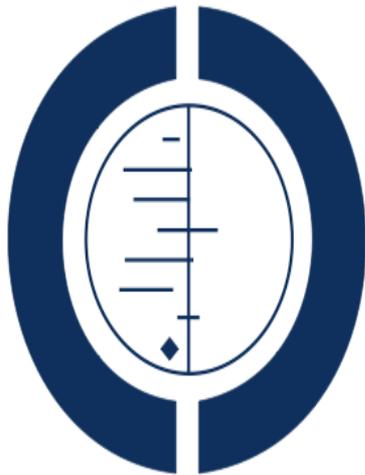
- MINIMUM of 2cm above dentate line!
- Very rare complications (<5%) include pelvic sepsis, massive bleeding, acute external thrombosis
- Make sure patients avoid ASA, anticoagulation is absolute contraindication



Rubber Band Ligation (RBL)

Rubber band ligation versus excisional haemorrhoidectomy for haemorrhoids (Review)

Shanmugam V, Campbell KL, Loudon MA, Rabindranath KS, Steele RJC, Thaha MA



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- “RBL can be adopted as the choice of treatment for grade II hemorrhoids with similar results but without the side effects of EH while reserving EH for grade III hemorrhoids or recurrence after RBL”

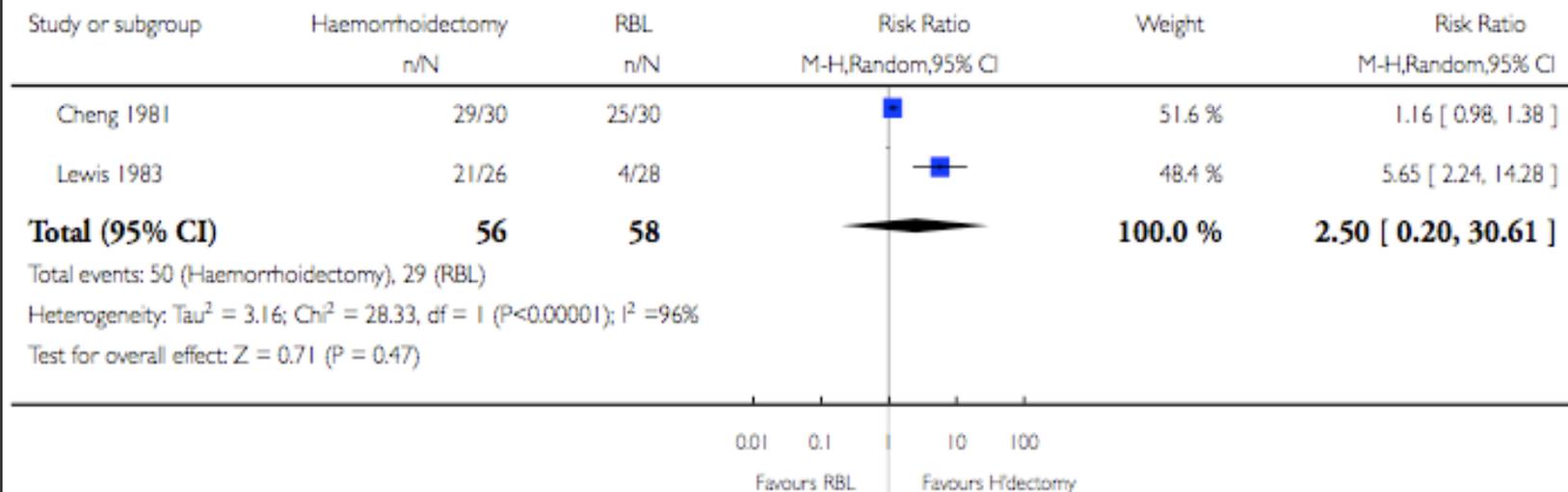
Cochrane Review: 2 RCTs, 114 patients (Grade III)

Analysis 1.4. Comparison 1 Rubber band ligation versus surgical haemorrhoidectomy for haemorrhoids, Outcome 4 Number of patients cured of haemorrhoidal disease.

Review: Rubber band ligation versus excisional haemorrhoidectomy for haemorrhoids

Comparison: 1 Rubber band ligation versus surgical haemorrhoidectomy for haemorrhoids

Outcome: 4 Number of patients cured of haemorrhoidal disease



Cure rates favor excisional hemorrhoidectomy

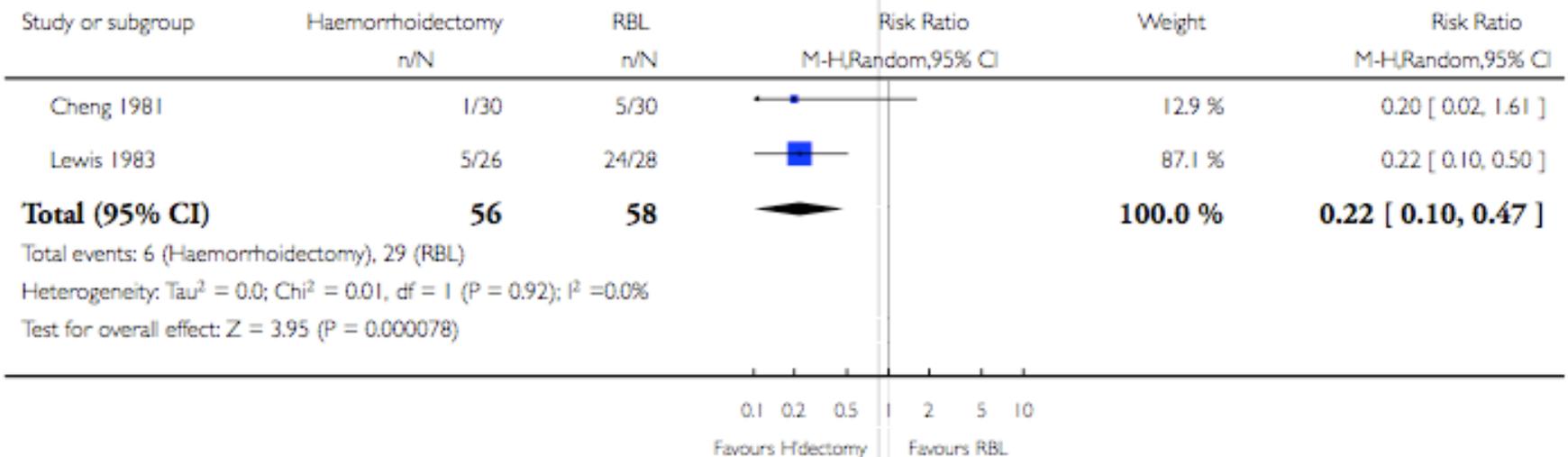
Cochrane Review; RBL vs. EH

Analysis 1.7. Comparison 1 Rubber band ligation versus surgical haemorrhoidectomy for haemorrhoids, Outcome 7 Number of patients required re-treatment.

Review: Rubber band ligation versus excisional haemorrhoidectomy for haemorrhoids

Comparison: 1 Rubber band ligation versus surgical haemorrhoidectomy for haemorrhoids

Outcome: 7 Number of patients required re-treatment



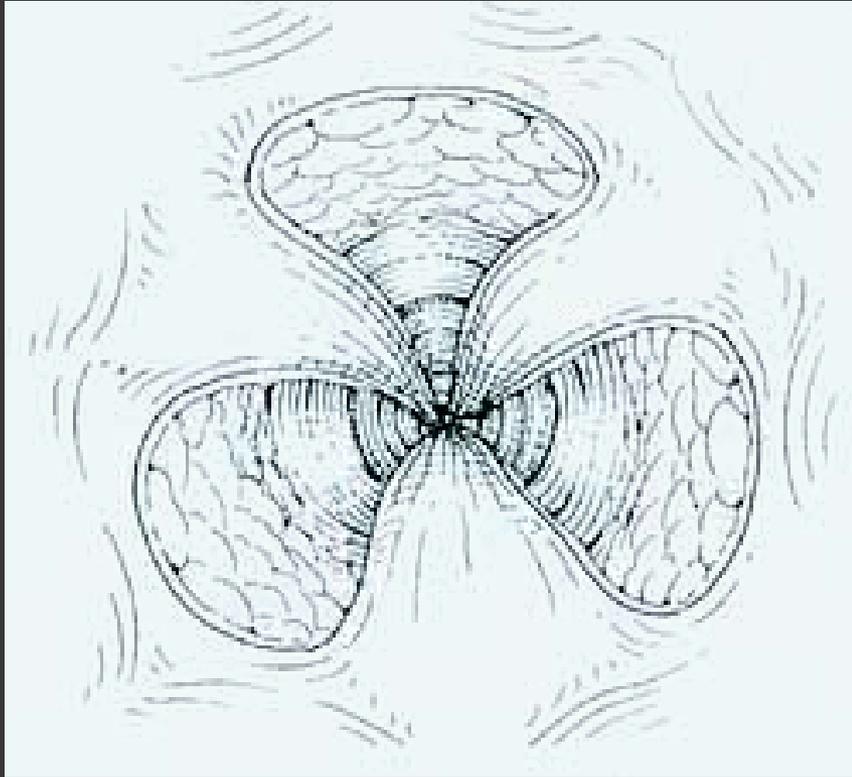
Satisfaction outcomes and cure rates were not significantly different for Grade II hemorrhoids: 1 RCT, 32 patients

Other “Office” Procedures

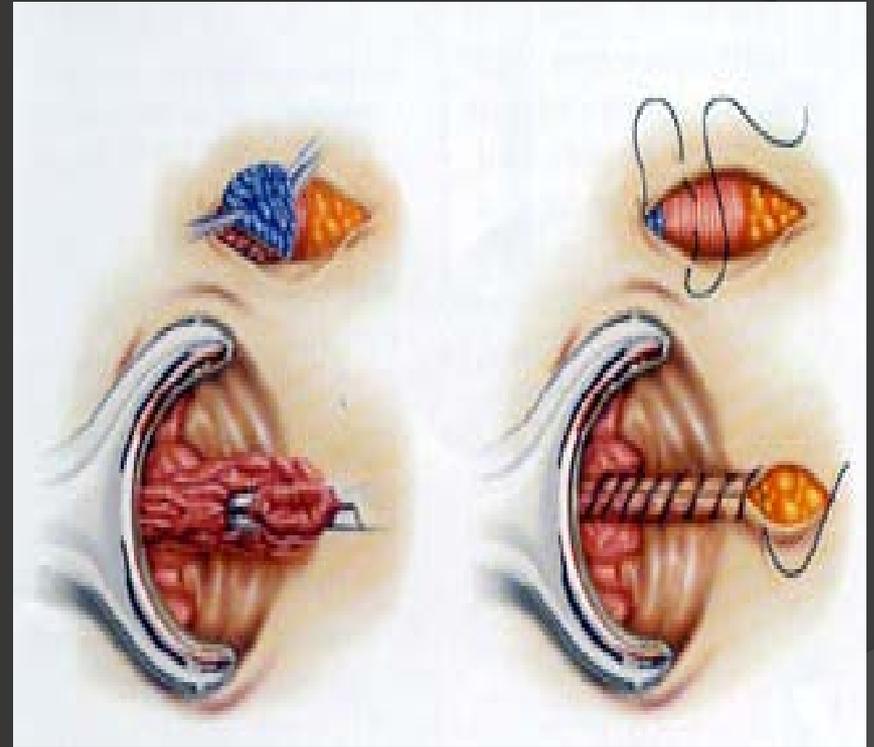
- ⊙ *Infrared Photocoagulation, Bipolar Diathermy, Direct-Current Electrotherapy*
 - All seem to be most effective with Grade I and II
 - Most require multiple applications
- ⊙ *Sclerotherapy (Morgan-1869, 5% phenol)*
 - Results range from no difference to placebo vs. improvement or cure in 90% of patients
 - Can be painful, high recurrence rate (30% @4yrs)*
- ⊙ *Cryotherapy*
 - Generally abandoned due to foul odor from necrosis and pain

*Fleshman, et al; Current Surg Therapy 2004

Excisional (Operative) Hemorrhoidectomy



Milligan-Morgan (open)



Modified Ferguson (closed)

Closed vs. Open Hemorrhoidectomy; RCTs

Author	N	Pain	Complete Wound Healing	Analgesics	Hospital Stay	Complications
Ho	67	NS	Open>Closed	NS	NS	NS
Carapeti	36	NS	NS	NS	NS	NS
Arbman	77	NS	Closed>Open	NS	NS	NS
Gencosmanoglu	80	C>O	Closed>Open	C>O	NS	Closed>Open

Common complications include Urinary Retention (up to 36%), Bleeding (0.03 to 6%), Anal Stenosis (0-6%), Infection (0.5-5.5%), and Incontinence (2-5%)

Ligasure™



- Can coagulate up to 7mm vessels
- Limited thermal spread
- Potential for reduced postoperative pain, operative time, bleeding
- Numerous conflicting studies from 2000+

Ligasure™

Conventional versus LigaSure hemorrhoidectomy for patients with symptomatic Hemorrhoids (Review)

Nienhuijs SW, de Hingh IHJT



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2009

Twelve studies; n=1142

Implications for practice
“Since the usage of the Ligasure-technique results in significantly less postoperative pain after hemoroidectomy without any adverse effect on postoperative complications, hospital stay, and incontinence rate, this technique is superior in terms of patient tolerance.”

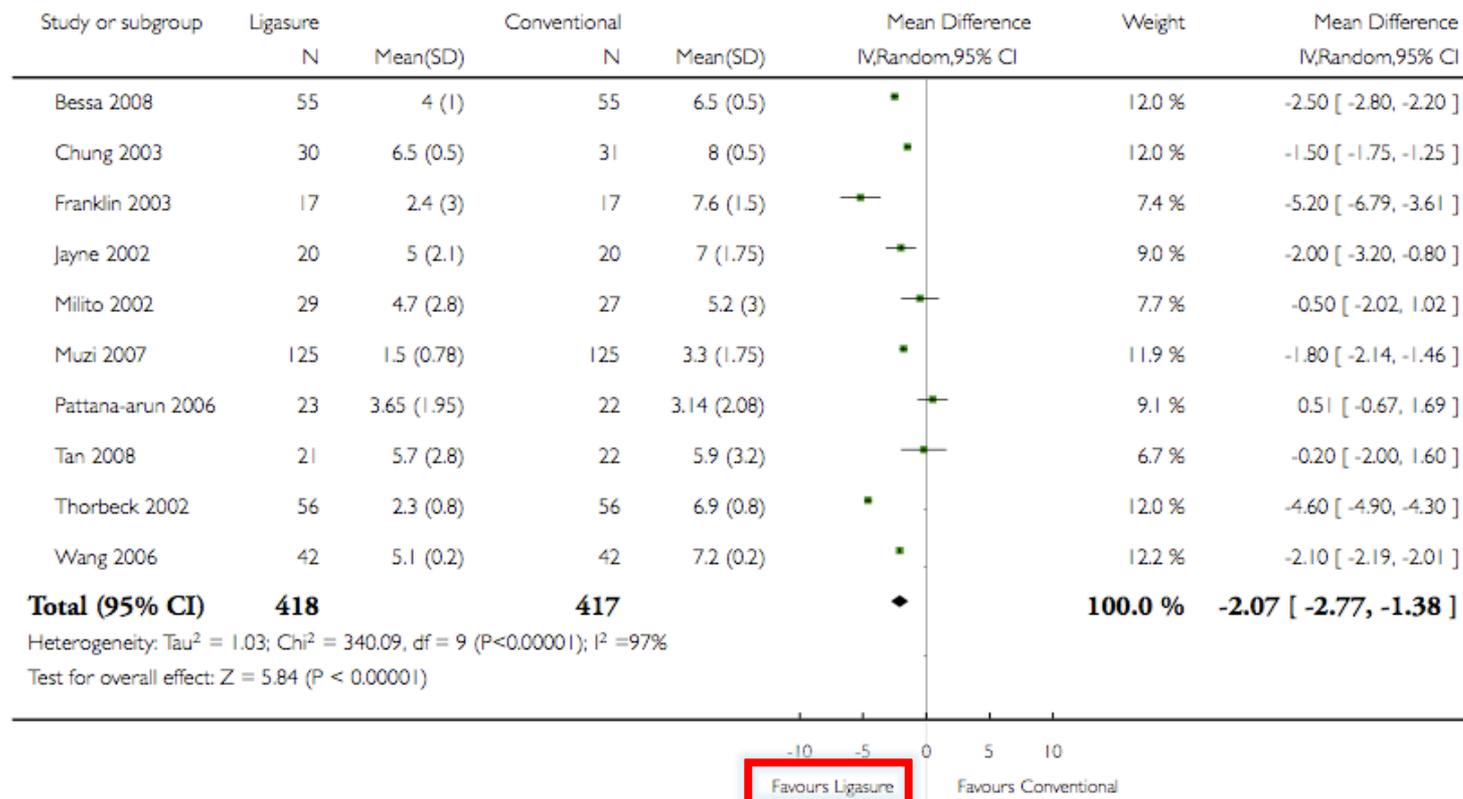
Ligasure™: Postoperative Pain

Analysis 1.1. Comparison 1 Pain, Outcome 1 Pain score at day 1.

Review: Conventional versus LigaSure hemorrhoidectomy for patients with symptomatic Hemorrhoids

Comparison: 1 Pain

Outcome: 1 Pain score at day 1



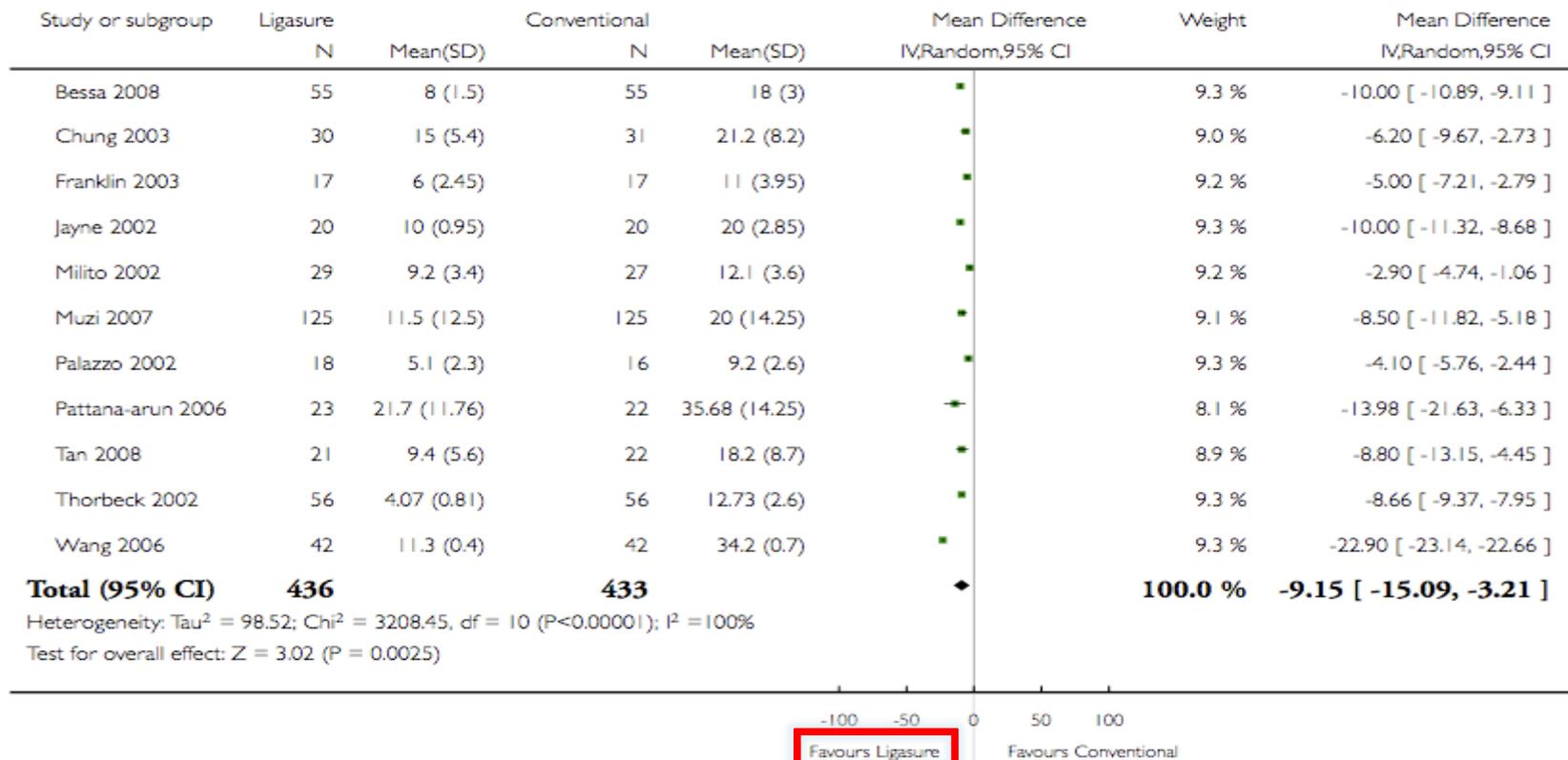
Ligasure™: OR Time

Analysis 2.1. Comparison 2 Procedure, Outcome 1 Operating time in minutes.

Review: Conventional versus LigaSure hemorrhoidectomy for patients with symptomatic Hemorrhoids

Comparison: 2 Procedure

Outcome: 1 Operating time in minutes

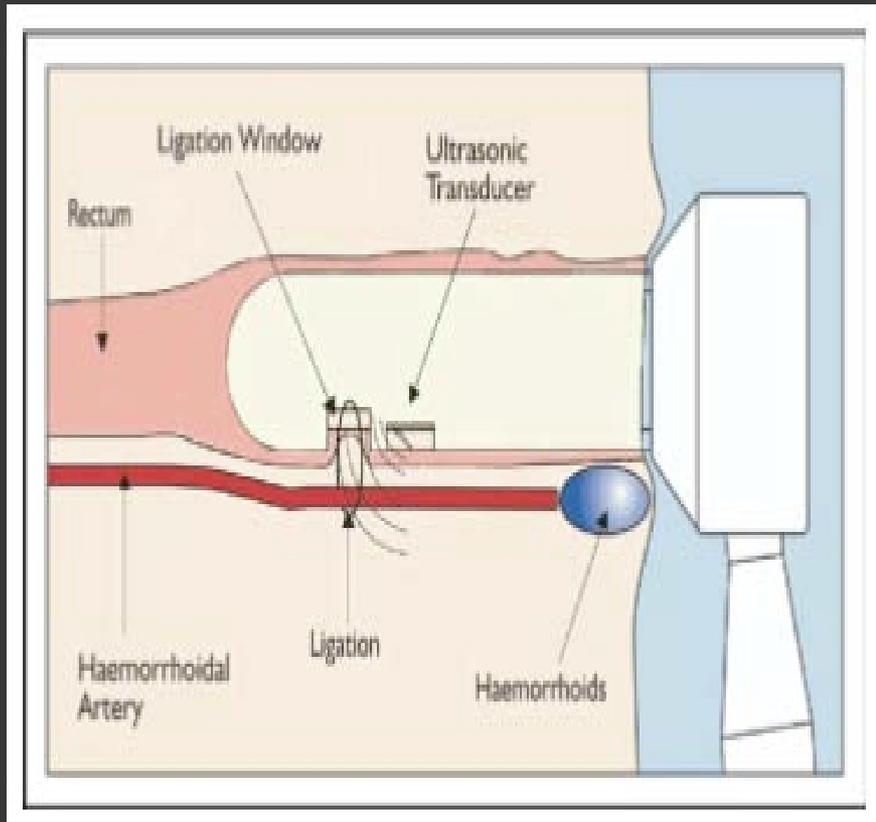


Operative Procedures: DG-HAL

- ◎ *A Novel Therapy for Internal Hemorrhoids: Ligation of the Hemorrhoidal Artery with a Newly Devised Instrument (Moricorn) in Conjunction with a Doppler Flowmeter Kazumasa Morinaga M.D.*
- ◎ *American Journal of Gastroenterology-(90), 4;1995*



DG-HAL



- Identify terminal branches of superior hemorrhoidal arteries
- Suture pusher for ligation
- Ligate 2-8 bundles (2cm above dentate line)
- Devascularize and shrink hemorrhoids
- Suitable for grade II-IV hemorrhoids

DG-HAL

⦿ Benefits

- Can be performed under local w/ sedation
- Relatively painless (0-5%)
- Minimal risk of harming continence
- Can ligate multiple bundles

⦿ Drawbacks

- Learning curve w/ device
- Long term recurrence rate up to 22%
- May require multiple procedures

DG-HAL

Table 1. Results of studies performed on Doppler-guided HAL technique

Study	Year	N	Stage of hemorrhoids (%)	No. of ligatures	Hospital stay	Complications (%)	Recurrence (%)	Follow-up (mo)
Morinaga <i>et al.</i> ⁴	1995	116	NS	NS	Outpatient	Pain 5 Bleeding 12	3	1
Sohn <i>et al.</i> ²²	2001	60	II 33, III 45, IV 22	6	Outpatient	Pain 8 Thrombosis 7 Fissure 2	3	12
Bursics <i>et al.</i> ²³	2004	30	II 23, III 33, IV 44	6	Outpatient	Nausea 6	13	12
Felice <i>et al.</i> ²¹	2005	68	III 100	NS	Outpatient	Pain 3 Thrombosis 3 Bleeding 1.5	6	11
Ramirez <i>et al.</i> ²⁴	2005	32	III 85, IV 15	5	Outpatient	Bleeding 18 Thrombosis 3 Fissure 3	22	12
Scheyer <i>et al.</i> ²⁰	2006	308	II 28, III 62, IV 10	6	2 days	Bleeding 5 Thrombosis 3 Pain 1.5 Fissure 1.5 Stool retention 1	15	18
This series	2007	100	II 1, III 78, IV 21	8	Outpatient 79% 1 day 13% 2 days 8%	Pain 5 Bleeding 4 Fissure 2 Thrombosis 3 Dyschezia 1	12	36

NS = not specified.

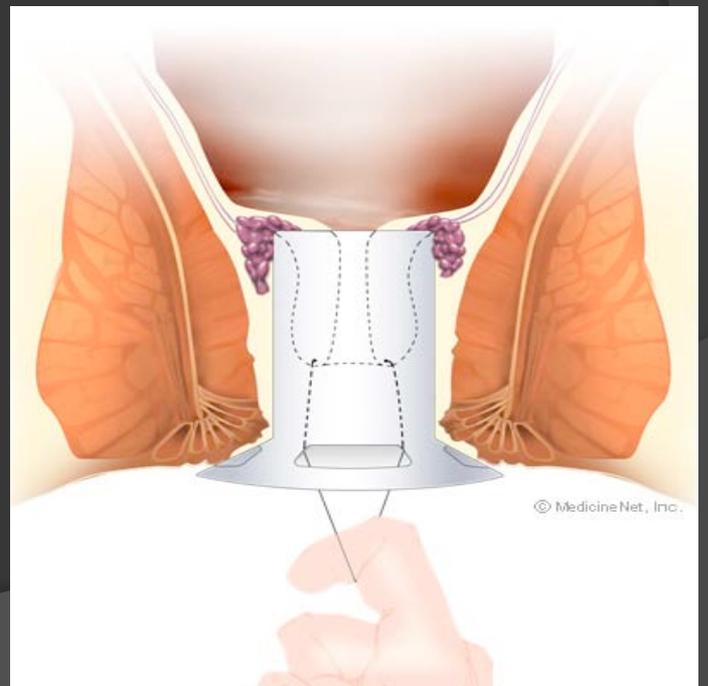
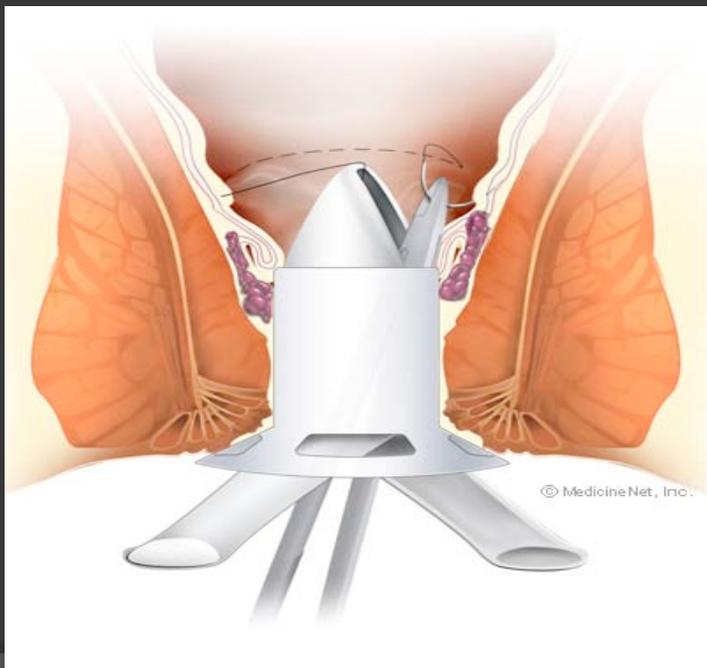
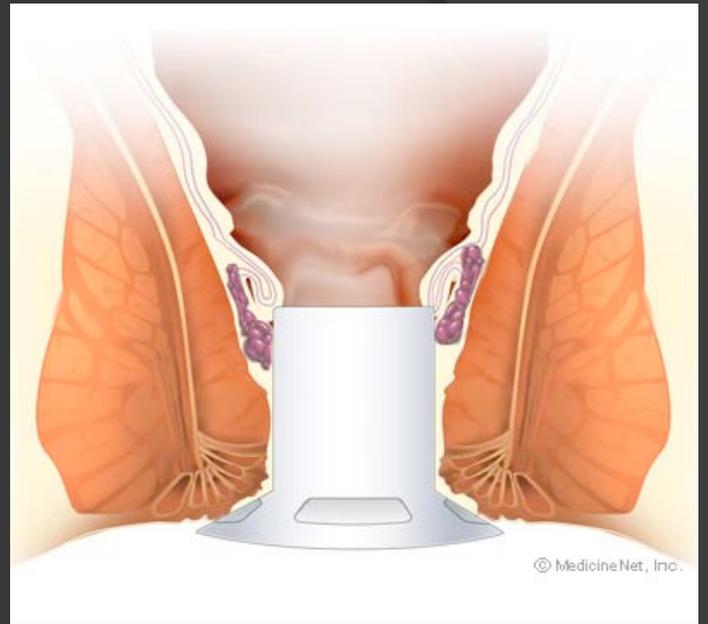
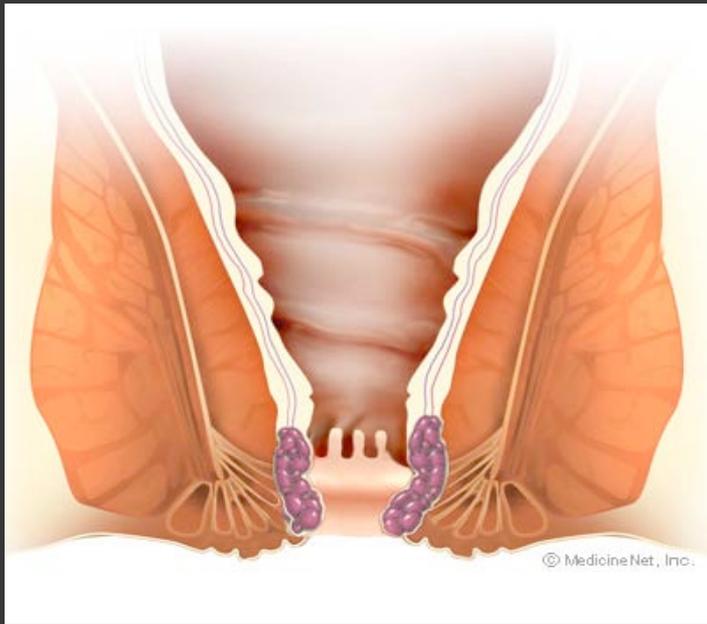
Jean-Luc Faucheron, M.D., Ph.D.¹ • Yves Gangner, M.D.²

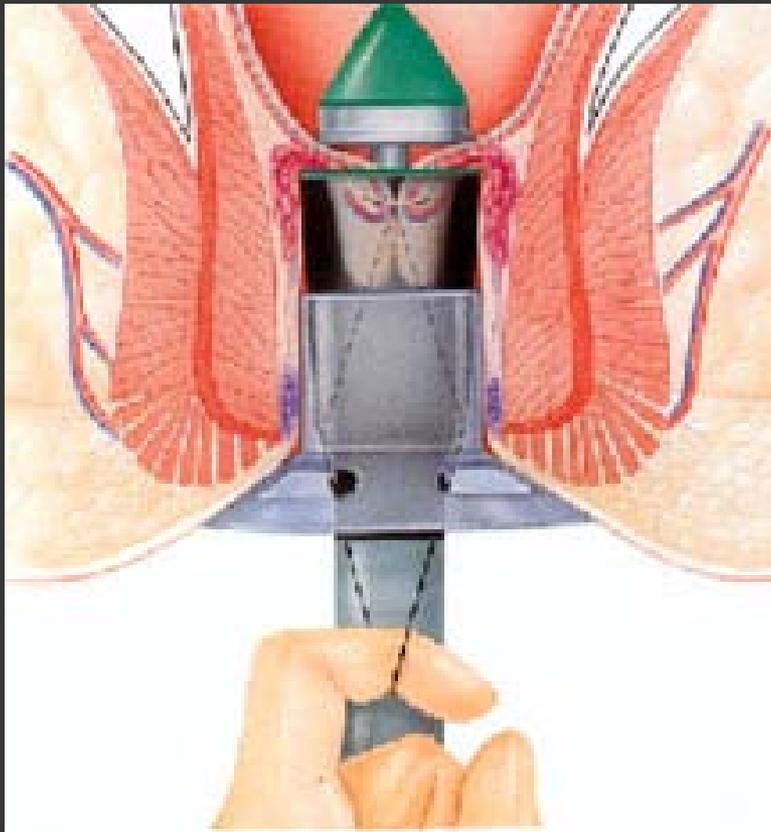
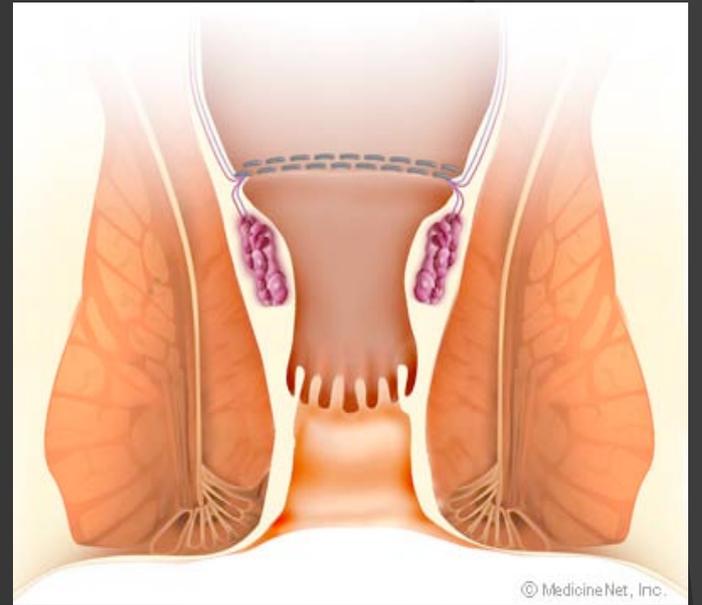
DG-HAL

- ◎ <http://youtu.be/kluxK0TVIyE> - t=2m3s

PPH or Procedure for Prolapsed Hemorrhoids (Stapled Hemorrhoidectomy)

- 1st described by *Pescatori et al* for mucosal prolapse, refined by *Longo* for tx of hemorrhoids (1998)
- Mucosal to mucosal anastomosis via stapled excision of submucosa proximal to the dentate line
- Lifts hemorrhoidal plexus back into normal anatomic position rather than removing it





PPH

- ◎ <http://youtu.be/6uweUL4SAYI> - t=1m40s

PPH (Stapled hemorrhoidectomy)

- ⦿ Initial trials showed safety profile (very low rates of incontinence)
- ⦿ Reports of some serious adverse events
 - Rectal perforation, pelvic sepsis
- ⦿ 2 Meta-analyses* (58 trials) showed decreased p-op pain, shorter OR time, and higher recurrence rates with PPH

**Burch et al*, Health Tech Assessment 2009

Shao et al, British Journal of Surgery 2008;95(2):147–160

Stapled versus conventional surgery for hemorrhoids (Review)

Jayaraman S, Colquhoun PH, Malthaner R



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2010

- ◎ 12 RCTs from 1998 to 2009
- ◎ N=955
- ◎ 5 trials (439 patients) had f/u of one year or more

Cochrane review, Stapled vs. Excisional

- ⦿ Higher recurrence rate overall in stapled group (23/269 vs. 4/268, OR 3.85)
- ⦿ *“Conventional surgical hemorrhoidectomy results in fewer recurrences than stapled hemorrhoidopexy”*
- ⦿ Pain is significantly improved with SH

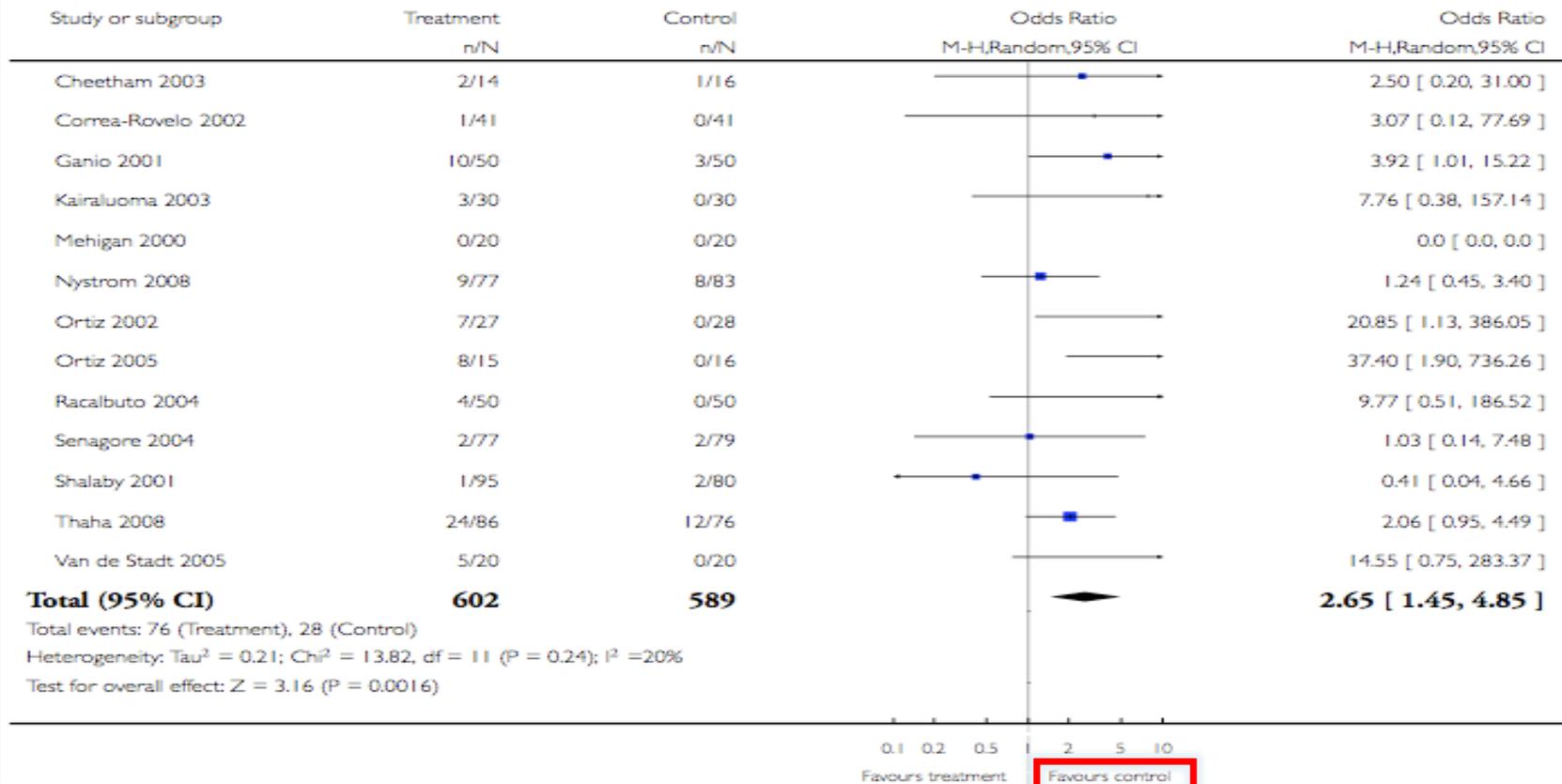
PPH vs. Conventional

Analysis 3.1. Comparison 3 Prolapse, Outcome 1 Proportion of patients complaining of hemorrhoidal prolapse at final follow-up.

Review: Stapled versus conventional surgery for hemorrhoids

Comparison: 3 Prolapse

Outcome: 1 Proportion of patients complaining of hemorrhoidal prolapse at final follow-up



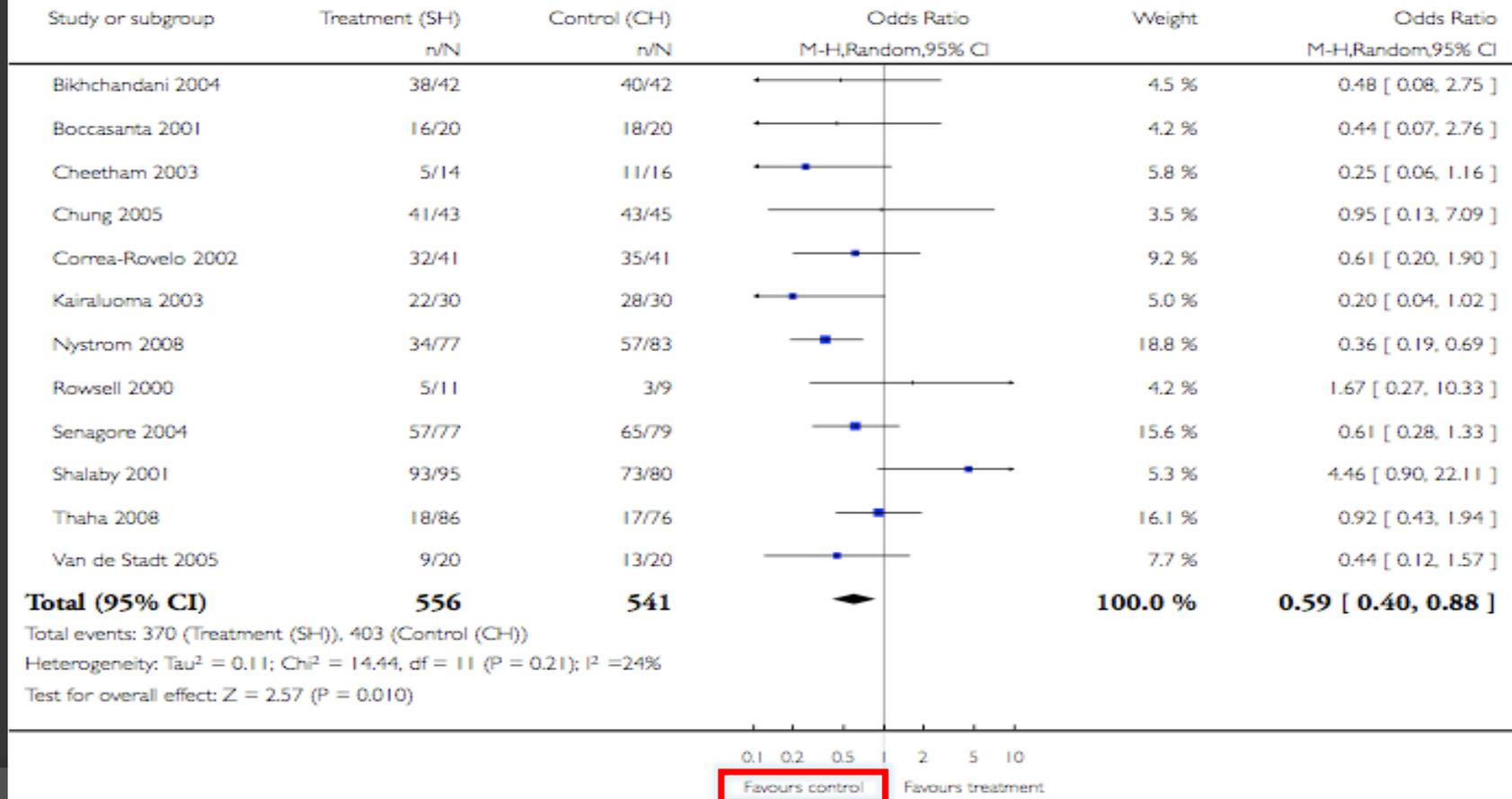
PPH vs. Conventional

Analysis 1.1. Comparison 1 Asymptomatic patients, Outcome 1 patients with no hemorrhoidal symptoms.

Review: Stapled versus conventional surgery for hemorrhoids

Comparison: 1 Asymptomatic patients

Outcome: 1 patients with no hemorrhoidal symptoms



PPH vs. DG-HAL

Int J Colorectal Dis (2009) 24:1401–1405

DOI 10.1007/s00384-009-0803-2

ORIGINAL ARTICLE

Treatment of grade III and IV haemorrhoidal disease with PPH or THD. A randomized trial on postoperative complications and short-term results

Sebastiaan Festen • M. J. van Hoogstraten •
A. A. W. van Geloven • M. F. Gerhards

N=43, 1° endpoint= Symptom resolution @6 weeks

PPH vs. DG-HAL

- @6wks, preoperative symptoms were resolved in 15 patients (83%) in the PPH group versus 18 patients (78.3%) in the THD group ($P= 0.648$)
- 11% had persistent prolapse in PPH vs 22% in DG-HAL group

VAS score	PPH (range)	THD (range)	Difference (95% CI)	<i>P</i> value
Day 1	5.1 (2–10)	3.1 (1–6)	1.98 (1.02 to 2.94)	0.00
Day 7	3.2 (1–8)	1.6 (0–5)	1.66 (0.70 to 2.62)	0.00
Day 21	1 (0–7)	0.2 (0–2)	0.78 (–0.18 to 1.74)	0.06

PPH: Summary

- ◎ Safety and technique has been well established (low rates of incontinence, bleeding, pain)
- ◎ Pt selection important
 - Circumferential disease, absence of external hemorrhoids (II-III), those concerned with p-op pain

Hemorrhoids in Pregnancy

- Reserve treatment to excision of acutely thrombosed external hemorrhoids for symptomatic relief
- Common in early postpartum period and third trimester, most will resolve spontaneously
 - **Allow 6 weeks for resolution**

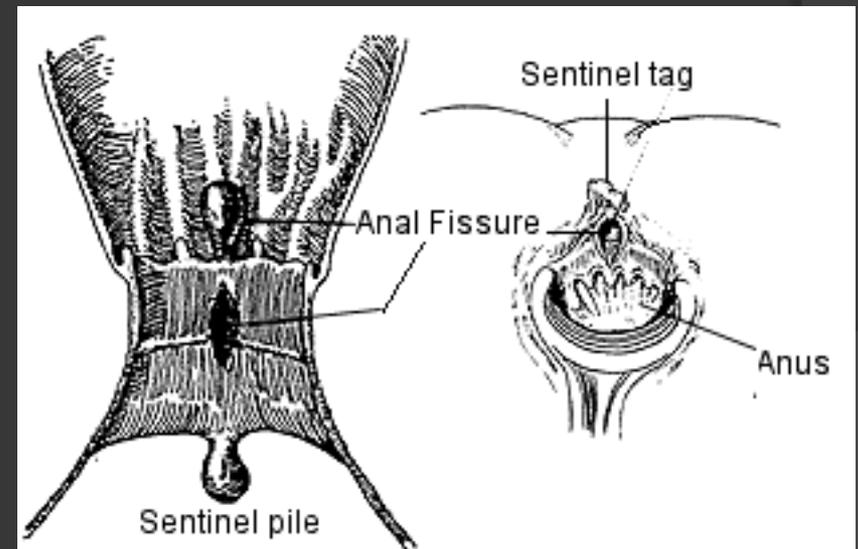
Hemorrhoids: Summary

- Operative treatment can be reserved to 10-15% of patients seen in surgical clinics
- Non-operative (“Office”) therapies are good first approach for grade I-II hemorrhoids
- Find a procedure you are comfortable with

Anal Fissure

- Ulcer of anoderm
- Posterior midline in 90% (10% anterior, <1% lateral)
- Etiology=spasm of internal sphincter + poor tissue perfusion

- *Shouten et al, Dis Colon Rectum 1994*



Anal Fissure: Etiology

- Sustained resting hypertonia by manometry in fissure patients
 - *Farouk R, Dis Colon Rectum, 1994*

Original article

Topographical distribution of blood supply to the anal canal

J. N. Lund, C. Binch*, J. McGrath, R. A. Sparrow* and J. H. Scholefield

Departments of Surgery and *Anatomy, University Hospital, Nottingham NG7 2UH, UK

Correspondence to: Mr J. N. Lund

“The arteriolar density is less in the posterior quadrant throughout the anal canal”

Anal Fissure: Is manometry necessary?

- Most studies show significant heterogeneity based on age, gender
- MRP of internal sphincter generally $>90\text{mmHg}$
- Most useful in those with prior surgery or question of hypotonia
- Change in pressure increment (PI) can be indicative of treatment success/response

Anal Fissure: Nonoperative Tx

- ◎ American Society of Colorectal Surgeons (ASCRS) recommends increased fiber/H₂O and sitz baths as first line therapy*
 - Healing rates up to 50%, recurrence rates almost 20% long term
- ◎ “Chemical sphincterotomy”
 - Nitrates, CCBs, Botox, adrenergics, topical muscarinics, etc...

* *Practice parameters for the management of anal fissures (3rd revision). Dis Colon Rectum 2010*

Botox

- 20-40u in 4ml, 27g syringe, inject internal sphincter on both sides (not external)
- Effect lasts 3-4 months, can repeat injections
- Minimal side effects, incontinence is rare, mild (gas), and usually transient

Summary of published series of BTX injections for anal fissure

Author	Year	# Patients	Units/site	Healing rate (%)
Gui et al [125]	1994	10	15 IAS	90
Jost et al [130]	1994	12	5 EAS	83
Jost et al [115]	1995	54	5 EAS	78
Mason et al [138]	1996	5	IAS	60
Jost et al [116]	1997	100	2.5-EAS	82
Espi et al [139]	1997	36	10 IAS/15 IAS	65/81
Maria et al [136]	1998	15	20 IAS	73
		15	Saline	13
Maria et al [120]	1998	23	15 IAS	100
		34	20 IAS	100
Minguez et al [121]	1999	23	10 IAS	83
		27	15 IAS	78
		19	21 IAS	90
Jost et al [117]	1999	25	20 EAS	76
		25	40 EAS	80
Brisinda et al [131]	1999	25	20 IAS	96
		25	Nitro	60
Fernandez et al [132]	1999	76	40 IAS	67
Gonzales et al [144]	1999	40	15 EAS	50
Madalinski et al [119]	1999	13	20 EAS	85
Khademi et al [140]	2000	11	25 IAS	82
Maria et al [137]	2000	25	20 IAS posterior	80
		25	20 IAS anterior	100
Lysy et al [133]	2001	15	20 IAS + nitrate	73
		15	20 IAS	60
Madalinski et al [118]	2001	14	25-50 EAS	54
Brisinda et al [122]	2002	75	20 IAS	100
		75	30 IAS	100
Trzcinski et al [134]	2002	13	50 IAS	85
Colak et al [142]	2002	3	30 IAS	71
		28	Lidocaine	21
Wollina et al [135]	2002	5	20-25 IAS	40
		5	50-75 IAS	100
Brisinda et al [126]	2003	6	150 IAS	100
Mentes et al [123]	2003	61	20-30 IAS	87
		50	Sphincterotomy	98
Siproudhis et al [141]	2003	22	100 IAS	32
		22	Saline	32
Giral et al [143]	2004	11	Sphincterotomy	82
		10	30 IAS	70

Abbreviations: EAS, external anal sphincter; IAS, internal anal sphincter.

Botox injections

- Initial healing rate ~80%
- Recurrence rate 15-50%
- Is it better than the gold standard?

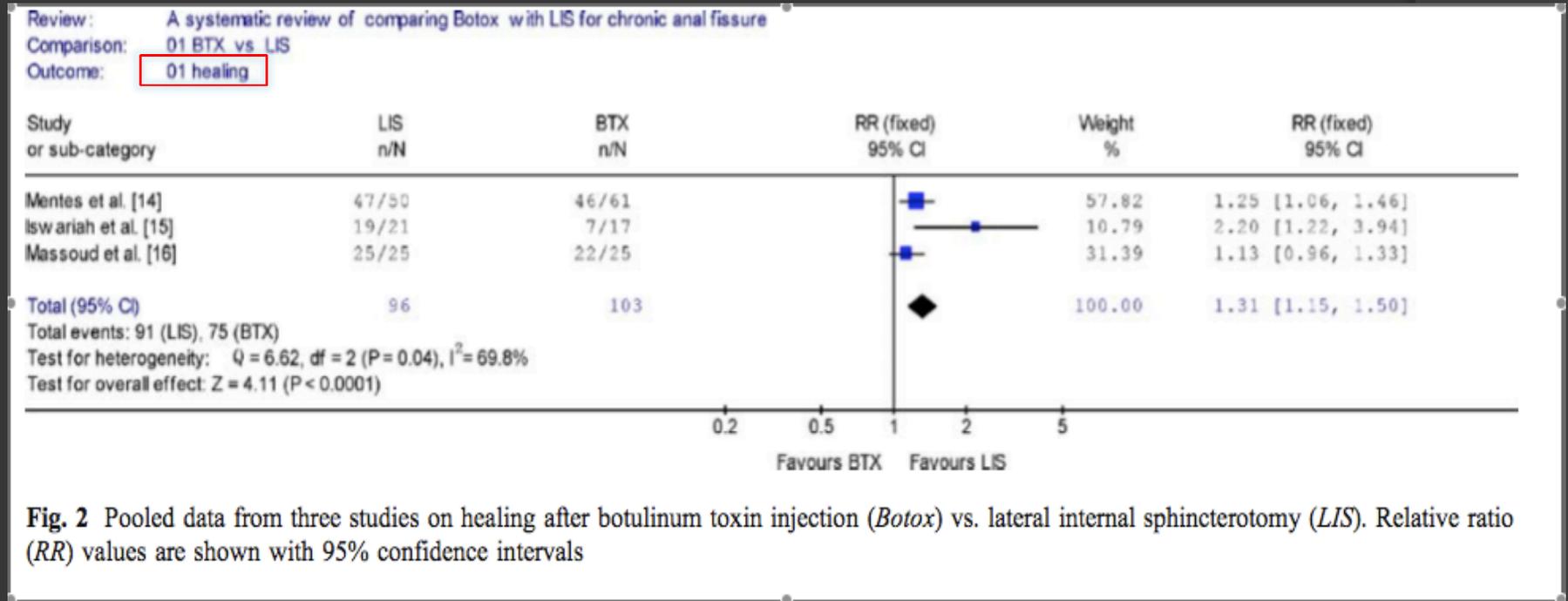
Systematic review and meta-analysis of randomized controlled trials comparing botulinum toxin injection with lateral internal sphincterotomy for chronic anal fissure

Wan-Jin Shao · Guo-Chun Li · Zhi-Kun Zhang

Accepted: 19 February 2009 / Published online: 6 March 2009
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- ④ 4 studies (RCTs), 279 patients; f/u 6 months to 3 years

Botox vs. LIS



90% healing rates or above for LIS vs 44-80% healing rates for Botox

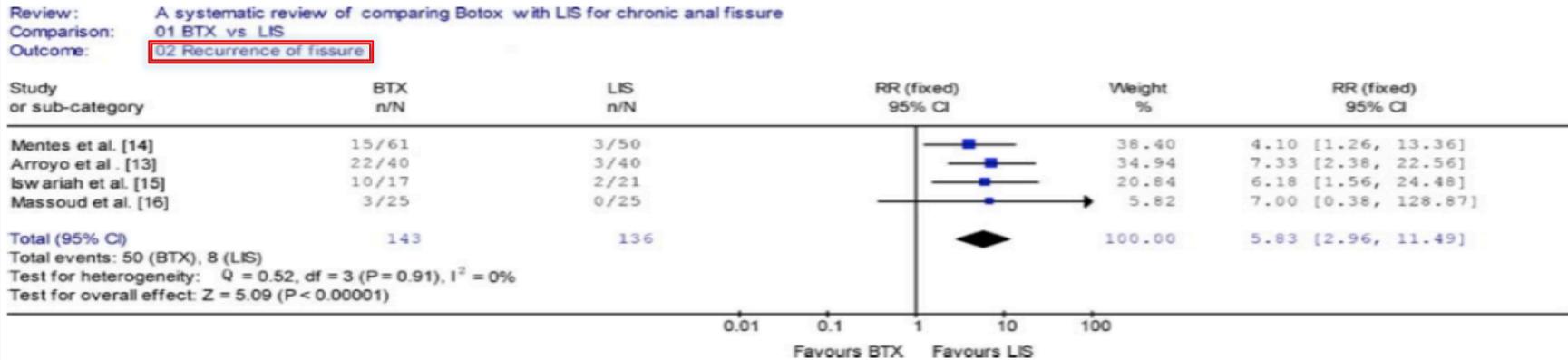


Fig. 3 Pooled data from four studies on recurrence rate after botulinum toxin injection (*Botox*) vs. lateral internal sphincterotomy (*LIS*). Relative ratio (*RR*) values are shown with 95% confidence intervals

Recurrence rates 10-55% in Botox vs. <10%

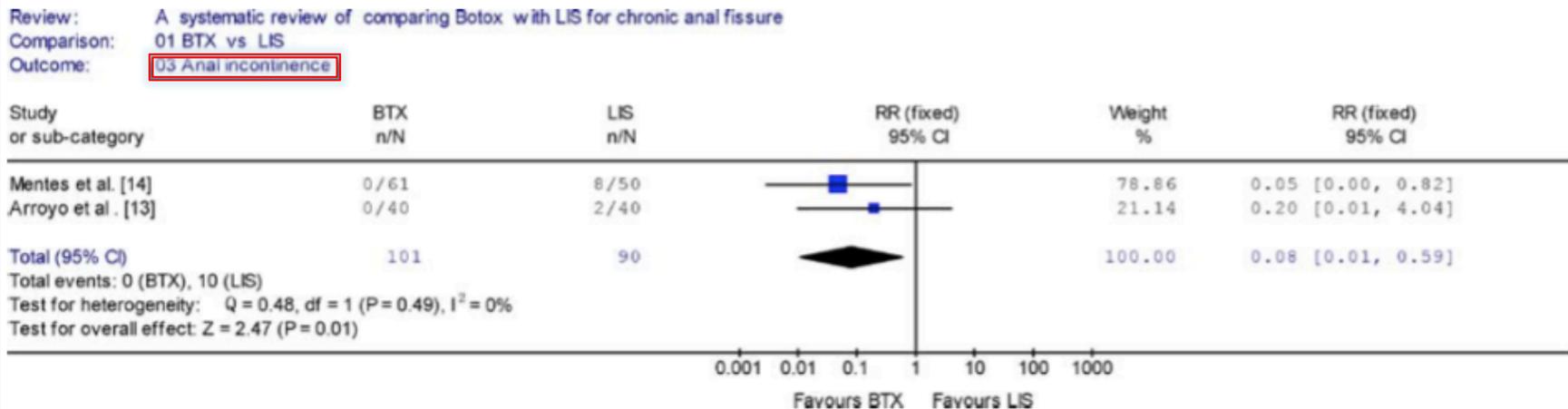


Fig. 4 Pooled data from two studies on minor anal incontinence after botulinum toxin injection (*Botox*) vs. lateral internal sphincterotomy (*LIS*). Relative ratio (*RR*) values are shown with 95% confidence intervals

Low incontinence rates in both groups (“mild” incontinence)

Non surgical therapy for anal fissure (Review)

Nelson RL



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2008

53 RCTs from 1966 to
2006

N=1100

11 agents studied
(nitroglycerin ointment
(GTN), isosorbide
dinitrate, Botulinum toxin
(Botox), diltiazem,
nifedipine (Calcium
channel blockers or
CCBs), hydrocortisone,
lignocaine, bran,
minoxidil, indoramin, and
placebo

Cochrane Review (2009)

- GTN was found to be marginally but significantly better than placebo in healing anal fissure (48.6% vs. 37%, $p < 0.004$)
- Botox and CCBs were equivalent to GTN in efficacy with fewer adverse events
- *“No medical therapy came close to the efficacy of surgical sphincterotomy, though none in these RCTs was associated with the risk of incontinence.”*

Anal Fissure, Surgical Treatment

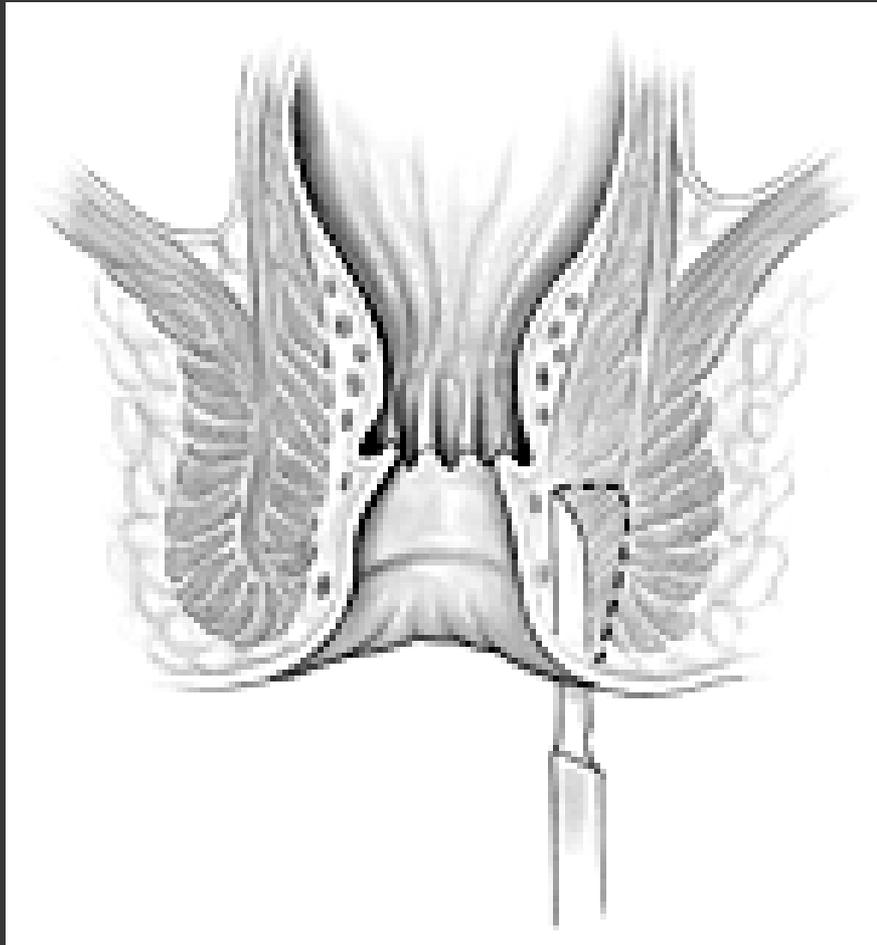
- Internal sphincterotomy introduced by Eisenhammer (1951)



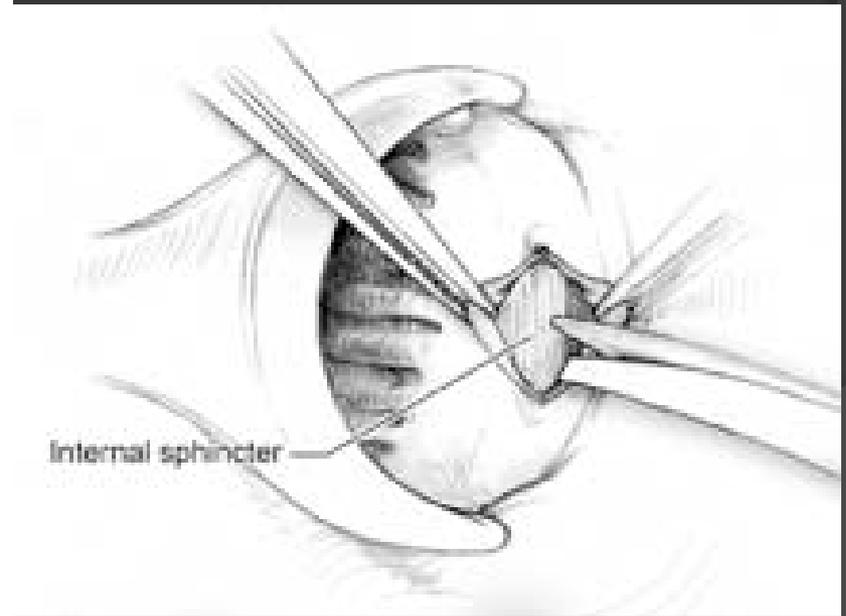
Notaras
popularized
lateral internal
sphincterotomy
in 1969

Keyhole Deformity

Anal Fissure, Surgical Treatment



Lateral internal sphincterotomy
(open and closed)



Lateral Internal Sphincterotomy (LIS)

- ◎ **GOLD STANDARD**: long term healing rates of 95% or above
- ◎ Closed and open have similar success rates, trend towards less complications with closed (i.e. incontinence) in some studies, (no difference seen in Cochrane review)
- ◎ Incontinence is the dreaded complication
 - Rates vary from 0% to 10%, based on definition

“Tailored LIS”

- Littlejohn and Newstead (1997) – recommended sphincterotomy for length of fissure rather than to dentate line, esp in women (0% incontinence)
- Pescatori et al (2002)– based extent of sphincterotomy on manometric resting pressures, from 0.5 to 2.5cm (for >90mmHg)
 - 4% recurrence rate

Anal Fissure, Summary

- Reserve surgical therapy for those who have failed non-operative treatments (ASCRS recommendation)
- Make patients aware of risks of recurrence and incontinence (2-5%) prior to sphincterotomy
- Open and closed LIS have equal efficacy

Pilonidal Disease (not cyst!)



- Pilus="hair"
Nidus="nest"
- First described by Mayo (1833)
- Term coined by Hodges (1860)
- Gluteal cleft theory (trapped hair/debris in midline follicles)

Acute Pilonidal Abscess

- Drainage at least 1cm off midline if possible to facilitate healing
- Unwise to attempt complete excision during acute inflammatory stage, midline pits might not be visible
- Packing usually not necessary, antibiotics usually reserved for significant cellulitis
- Shaving/sitz baths

Excision; Open vs. Closed? Midline vs. Off-midline?

Healing by primary versus secondary intention after surgical treatment for pilonidal sinus (Review)

McCallum I, King PM, Bruce J, AL-Khamis A



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2007

- 18 studies were included (N=1573)
- Twelve RCTs compared open healing with primary closure
- Six studies compared midline and off-midline closure

Pilonidal: Excisional Methods

- ◉ No overall difference in infection rates
- ◉ Higher risk of recurrence in closed group offset by prolonged recovery in open group (recurrence was 8% overall)
 - 53/381 (13%) closed
 - 18/375 (5%) open
- ◉ Off-midline closure had superior (lower) rates of infection, recurrence, and overall complications
 - Off-midline techniques included Karydakis, Limberg (rhomboid), and Modified-Limberg flaps

Open vs. Closed

Midline vs. Off-midline

Pilonidal Disease: Off-midline Techniques

- Karydakis flap: 7471 patients, f/u 2 to 20 yrs, recurrence rate of 1% in first 6545 patients



Karydakis GE.
Aust N Z J Surg: 62(5) 1992

Pilonidal Disease: Off-midline Techniques

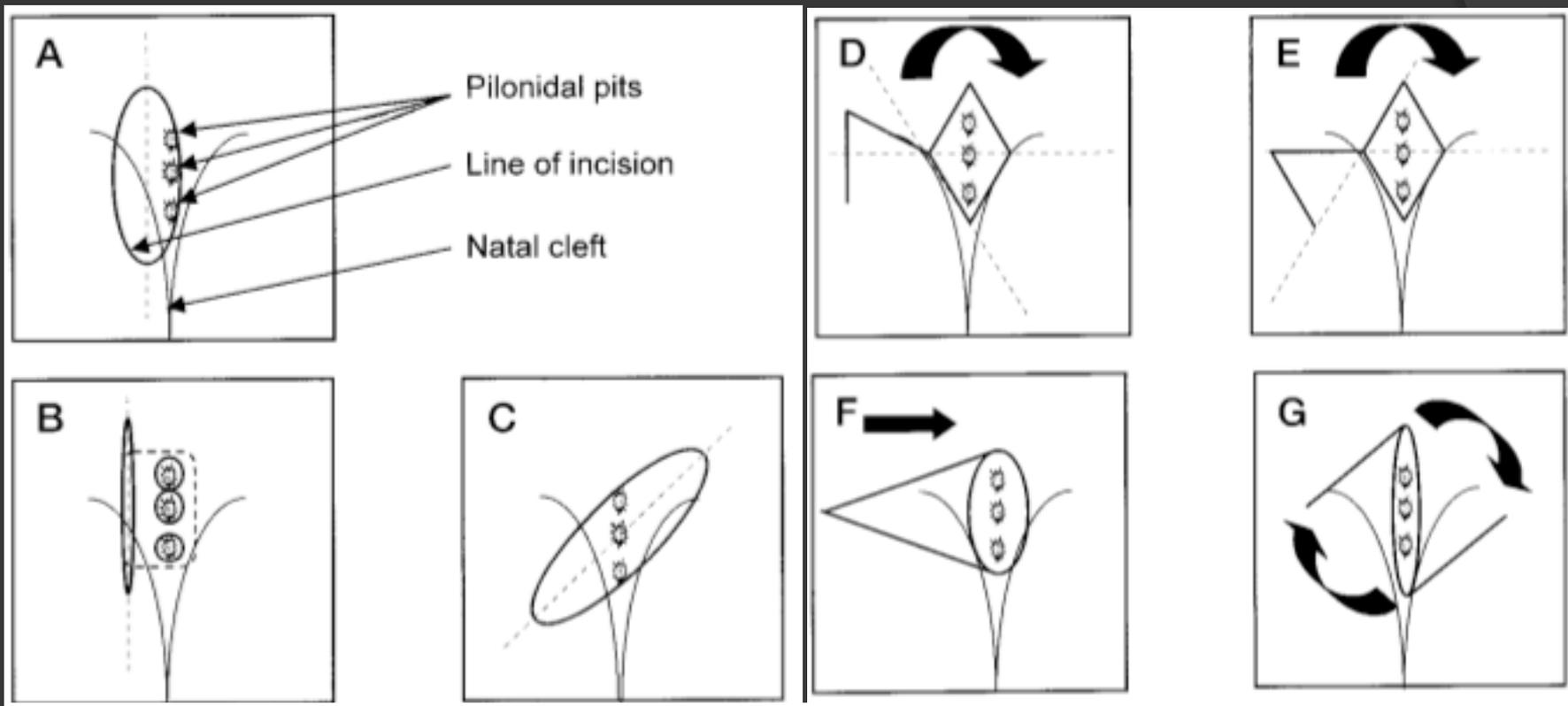
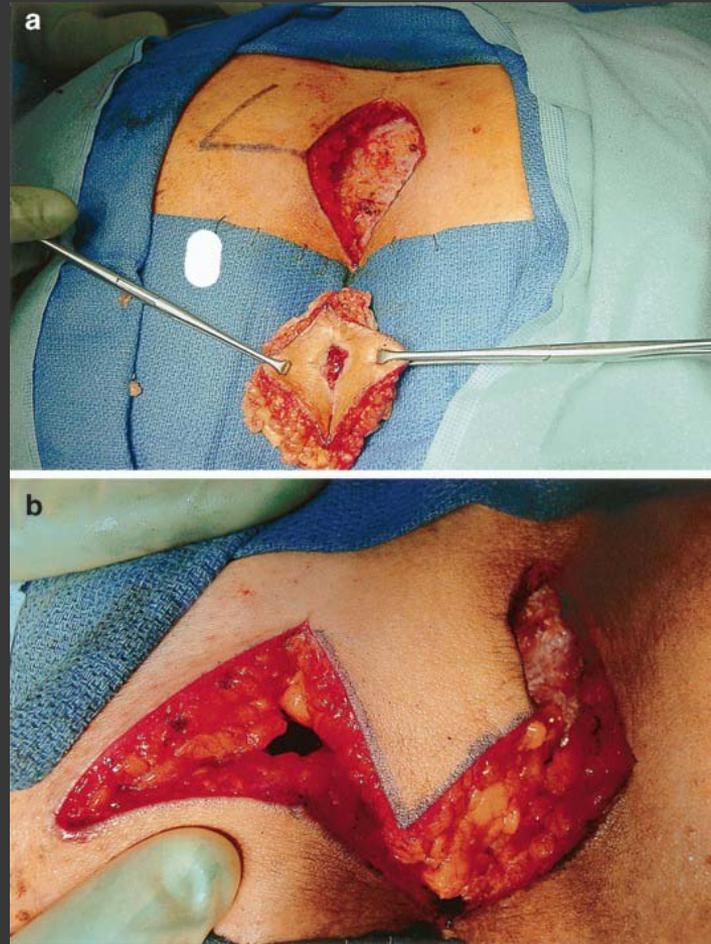
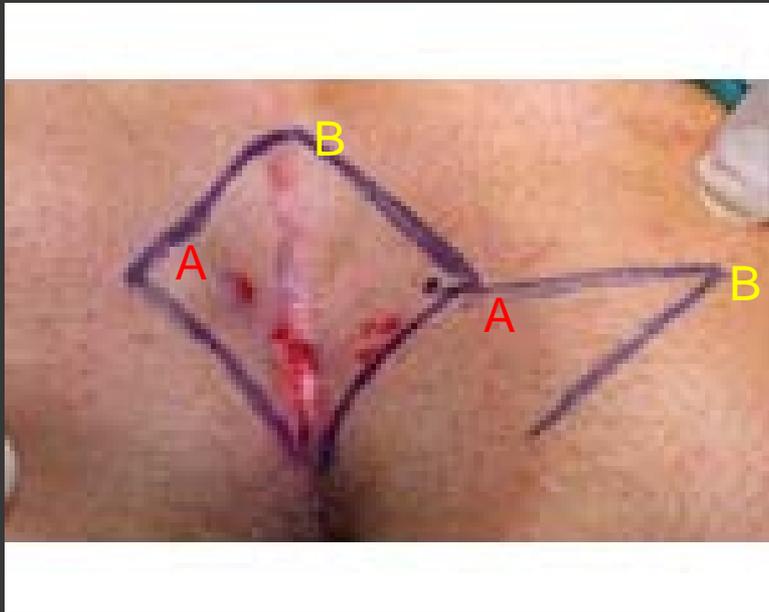


Figure 1. The various types of asymmetric and flap techniques. A. Karydakís flap B. Bascom procedure. C. oblique excision. D. Dufourmental rhomboid flap. E. Limberg rhomboid flap. F. Vy-plasty. G. Z-plasty. Arrows indicate the direction of rotation.

Off-midline Techniques; Rhomboid Flap



Rhomboid (Limberg) Flap



- Urhan et al: N=102, 100% healing rate (unspecified time), 6% complication rate, 5% recurrence rate
- Abu Galala et al: N=46, RCT rhomboid vs. midline closure, 9% recurrence in midline

Pilonidal disease: Fibrin Glue

Tech Coloproctol (2004) 8:95–98
DOI 10.1007/s10151-004-0063-7

© Springer-Verlag 2004

ORIGINAL ARTICLE

R. Greenberg • H. Kashtan • Y. Skornik • N. Werbin

Treatment of pilonidal sinus disease using fibrin glue as a sealant

- n=30, 13% wound infection rate, no recurrences

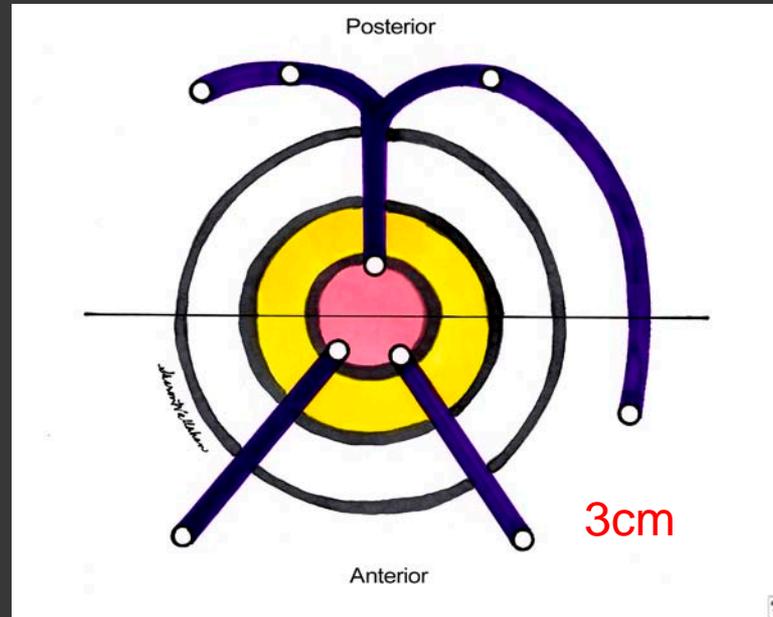
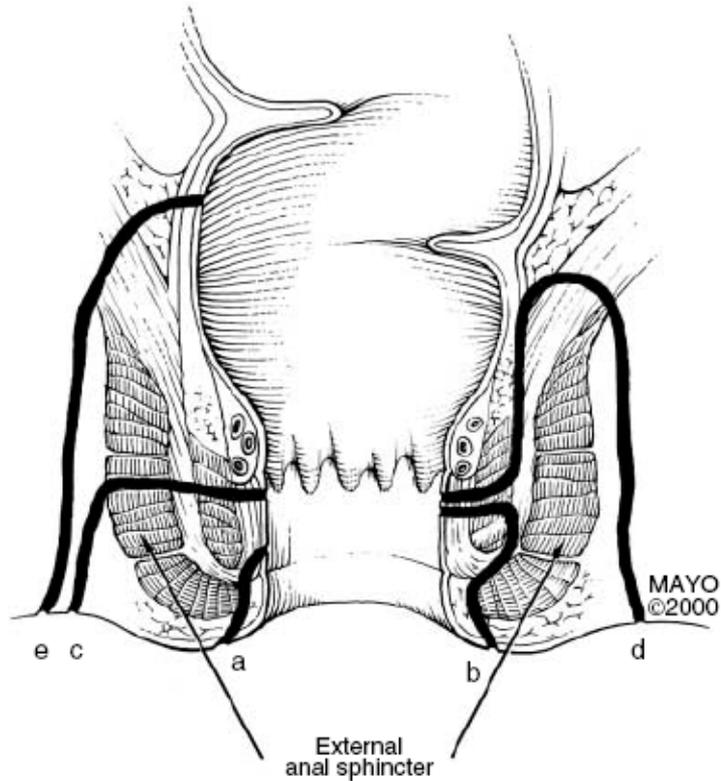
Pilonidal Disease, Summary

- Initial approach for uncomplicated disease should be conservative
“Don’t use a hammer to swat a fly”—
Patey Proc R Soc Med 1970
- Closed has benefit of quicker recovery, less pain, quicker return to work, higher recurrence
- *Off-midline has better results overall*

Fistula in Ano

Medscape®

www.medscape.com



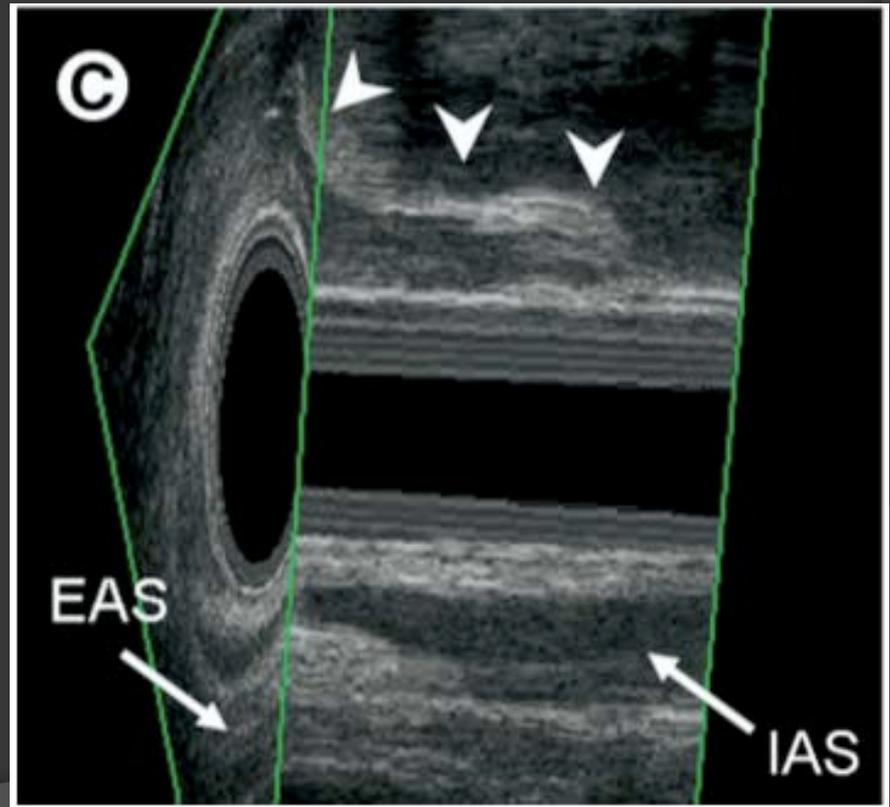
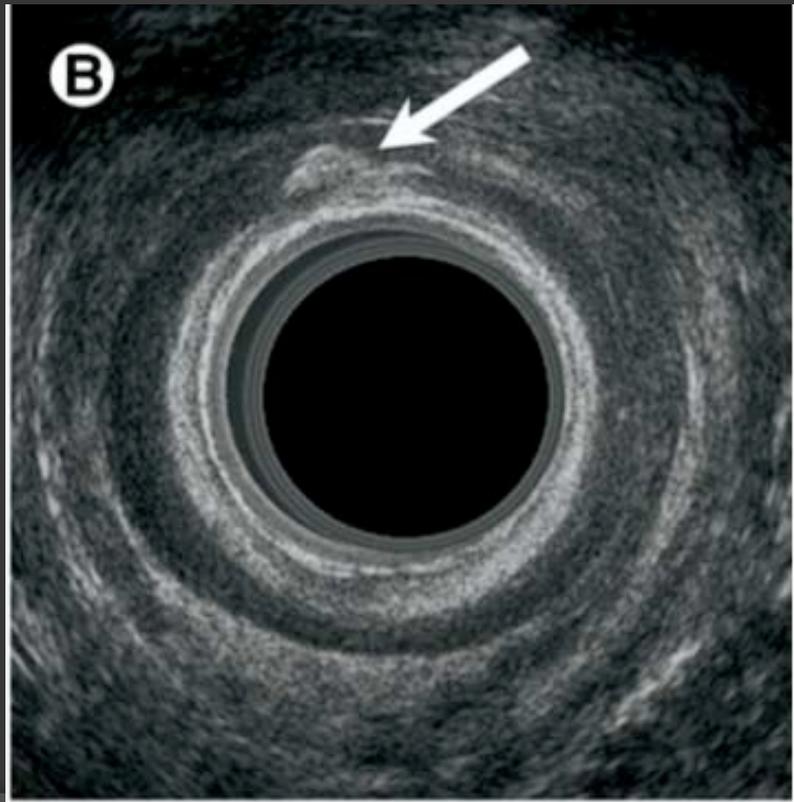
Source: Aliment Pharmacol Ther © 2004 Blackwell Publishing

Fistula in Ano

- Cryptoglandular origin* in (vs Crohn's, malignancy, hidradenitis, trauma)
- Treatment options range from laying open (fistulotomy), seton placement, advancement flaps
- Ideal therapy will **preserve anatomy as much as possible** with lowest recurrence rate and best quality of life

Fistula in ano: Evaluation

- Endoanal ultrasound (w/ peroxide enhancement)- 3D reconstruction

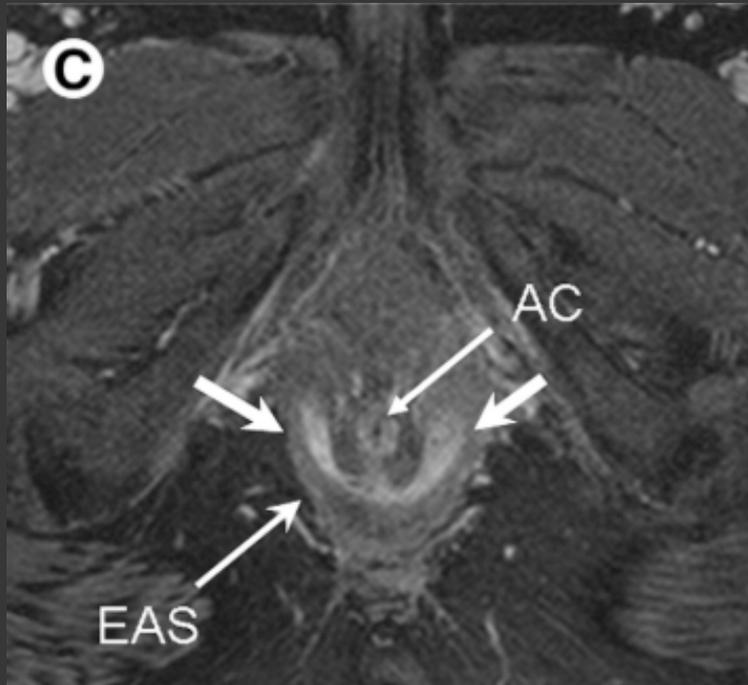


Fistula in Ano: EAUS

- ◎ Up to 93% identification of internal opening, >95% classification
 - (*Buchanan GN, Dis Colon Rectum 48: 2005*)
- ◎ Ultrasound compares favorably with MRI and findings at surgery
 - *West RL, Dis Colon Rectum 46: 2003*

Fistula in Ano: MRI

- ⦿ External coil (vs intraluminal), T₂ images most valuable, first described in 1990s
 - *Lunniss, PJ et al*, Magnetic resonance imaging of anal fistulae. Lancet 340: 1992
- ⦿ Identification of primary tract in 90%, and internal opening in up to 85%
- ⦿ Combination of 2 modalities EAUS/MRI + Exam under anesthesia approaches 100% accuracy
 - *West RL*, Hydrogen peroxide- enhanced three-dimensional endoanal ultrasonography and endoanal magnetic resonance imaging in evaluating perianal fistulas: agreement and patient preference Eur J Gastroenterol Hepatol 16: 2004



Fistula in Ano; Alternatives to Fistulectomy and Laying open

A Randomized, Controlled Trial of Fibrin Glue *vs.* Conventional Treatment for Anal Fistula

Ian Lindsey, M.B.B.S., F.R.A.C.S., M. M. Smilgin-Humphreys, R.N.,
Chris Cunningham, M.D., F.R.C.S., Neil J. M. Mortensen, M.D., F.R.C.S.,
Bruce D. George, M.S., F.R.C.S.

From the Department of Colorectal Surgery, John Radcliffe Hospital, Oxford, United Kingdom

2002, N=42; 13 simple fistulas and 29 complex
F/u @6 and 12 weeks

Table 2.
Fistula Healing

Type of Fistula	Primary Glue	Reglue	Cumulative Glue	Conventional Treatment
Simple	2/6 (33)	1/2 (50)	3/6 (50)	7/7 (100)
Complex	6/13 (46)	3/3 (100)	9/13 (69)	2/16 (13)
All fistulas	8/19 (42)	4/5 (80)	12/19 (63)	
Cryptoglandular	7/17 (41)	3/4 (75)	10/17 (59)	
Crohn's	1/2 (50)	1/1 (100)	2/2 (100)	

Figures are numbers and (percentages).

First described for perineal fistulae in 1991 by Hjortup and Kjaergard

Fistula in Ano: Fibrin Glue

Tech Coloproctol (2005) 9:89–94
DOI 10.1007/s10151-005-0204-7

REVIEW

M.T. Swinscoe · A.K. Ventakasubramaniam · D.G. Jayne

Fibrin glue for fistula-in-ano: the evidence reviewed

Simple: 63% healed
Complex: 35% healed

Table 1 Healing rates following fibrin glue treatment for fistula-in-ano

Reference	Year	Patients, n	Follow-up, months	Healing rate, %	Healing after re-glue, %
Loungnarath et al. [22]	2004	39	26	31	33
Tinay, El-Bakry [23]	2003	18	8	78	NA
Buchanan et al. [20]	2003	22	14	14	14
Zmora et al. [15]	2003	24 (G) 13 (G +F)	12	33 54	NA
Sentovich [19]	2003	48	22	60	69
Lindsey et al. [16]	2002	19	3	42	63
Chan et al. [27]	2002	10	6	60	NA
Cintron et al. [14]	2000	79	12	61	NA
Partlj et al. [21]	2000	69	28	74	NA
Venkatesh, Ramnujan [12]	1999	30	26	50	60
Aitola et al. [28]	1999	10	6	10	NA
Abel et al. [13]	1999	10	7	50	60

G, fibrin glue alone; G+F, fibrin glue plus advancement flap; NA, not available or unable to determine

Fistula in Ano: Fibrin Glue

Annals of Surgical Innovation and Research



Review

Open Access

Fibrin glue in the treatment of anal fistula: a systematic review

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Lorenzo Cattorini^{†1}, Barbara Rossetti^{†1}, Diego Milani^{†1}, Patrizia Ricci^{†2},
Piero Covarelli^{†3}, Marco Coccetta^{†1}, Giuseppe Noya^{†3} and
Francesco Sciannameo^{†1}

2009

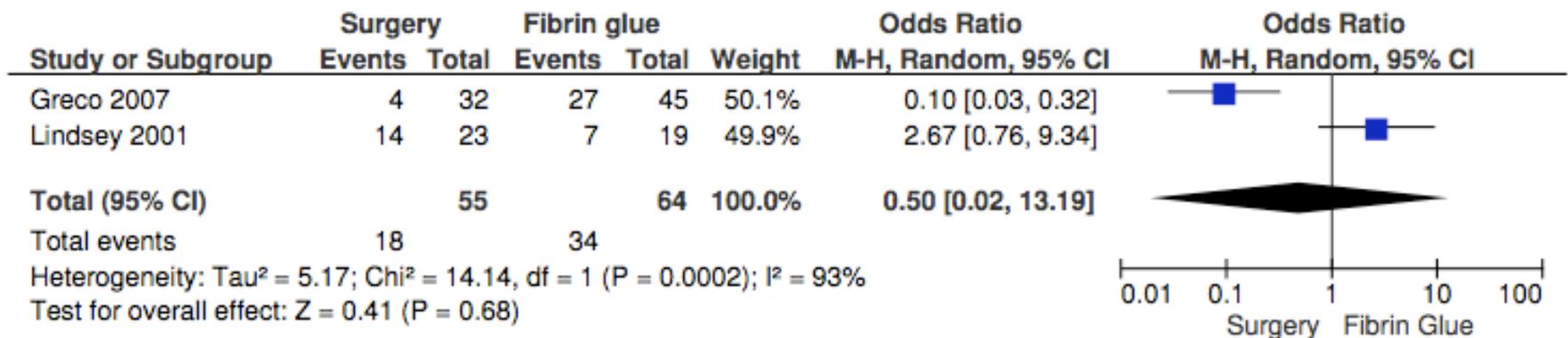


Figure 1

Healing: conventional surgical treatment versus fibrin glue treatment in patients with anal fistulas.

Fistula in Ano; Alternatives to Fistulectomy: Bioprosthetic Plug*

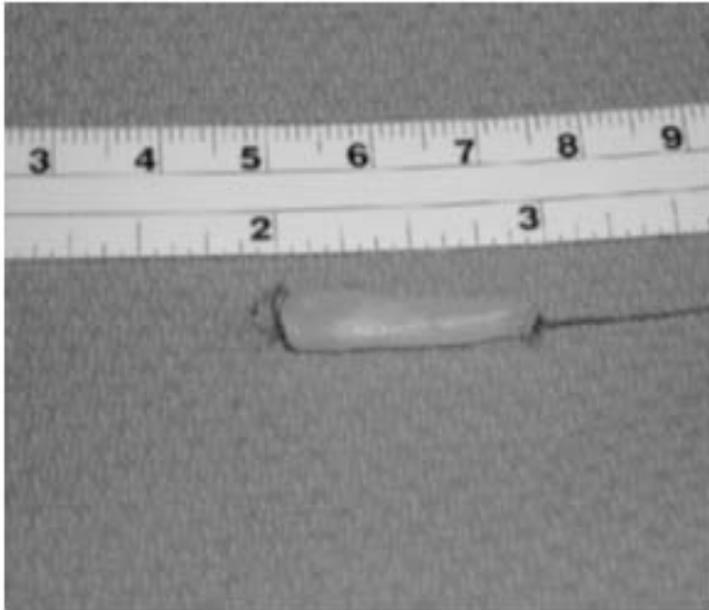


Figure 1. A bioprosthetic anal fistula plug made of Surgisis[®] ES is rehydrated and rolled into a cone configuration, which is held in place with a chromic tie.



Figure 2. The fistula plug is pulled into the primary opening where it lodges snugly, therefore, occluding the high-pressure area of the fistula tract.

*initially described by Champagne et al, 2006

Fistula in Ano: Plug

Consensus statement

doi:10.1111/j.1463-1318.2007.01423.x

The surgisis[®] AFP[™] anal fistula plug: report of a consensus conference*

Received 3 September 2007; accepted 3 September 2007

"The use of the plug for this indication was valid, if conventional fistulotomy posed a significant risk of incontinence"

Extrasphincteric fistulas (complex) vs intersphincteric fistulas (simple)—not recommended

Fistula in Ano; Alternatives to Fistulectomy: Bioprosthetic Plug

Diseases of the
Colon & Rectum

Anal Fistula Plug for Closure of Difficult Anorectal Fistula: A Prospective Study

Paul J. van Koperen, M.D.,¹ Andre D'Hoore, M.D., Ph.D.,² Albert M. Wolthuis, M.D.,² Willem A. Bemelman, M.D., Ph.D.,¹ J. Frederik M. Slors, M.D., Ph.D.¹

¹ Department of Surgery, Academic Medical Center, Amsterdam, The Netherlands

² Department of Abdominal Surgery, Gasthuisberg, University Clinics, Leuven, Belgium

@ 7mo avg f/u, 41% had healed

Table 1.
Patients' Characteristics

Patient	Gender	Age (yr)	Etiology	Previous Fistula Surgery (N)	Result	Follow-Up (mo)
1	M	58	Cryptoglandular	3	Closed	7
2	M	55	Cryptoglandular	4	Recurrence	9
3	M	75	Cryptoglandular	1	Recurrence	9
4	M	53	Cryptoglandular	6	Recurrence	9
5	M	62	Cryptoglandular	2	Recurrence	9
6	M	43	HIV	1	Closed	8
7	M	59	Cryptoglandular	1	Recurrence	9
8	M	32	Cryptoglandular	3	Recurrence	8
9	M	50	Cryptoglandular	1	Recurrence	8
10	F	51	Cryptoglandular	0	Recurrence	8
11	F	45	Cryptoglandular	4	Closed	7
12	F	27	Crohn's disease	1	Closed	7
13	M	32	Cryptoglandular	0	Recurrence	7
14	M	37	Cryptoglandular	0	Closed	6
15	M	36	HIV	2	Closed	5
16	F	39	Cryptoglandular	0	Recurrence	4
17	F	39	Cryptoglandular	0	Closed	3

M = male; F = female.

Glue vs Plug

Diseases of the Colon & Rectum

Efficacy of Anal Fistula Plug *vs.* Fibrin Glue in Closure of Anorectal Fistulas

Eric K. Johnson, M.D., Janette U. Gaw, M.D., David N. Armstrong, M.D., F.R.C.S.

Georgia Colon & Rectal Surgical Clinic, Atlanta, Georgia

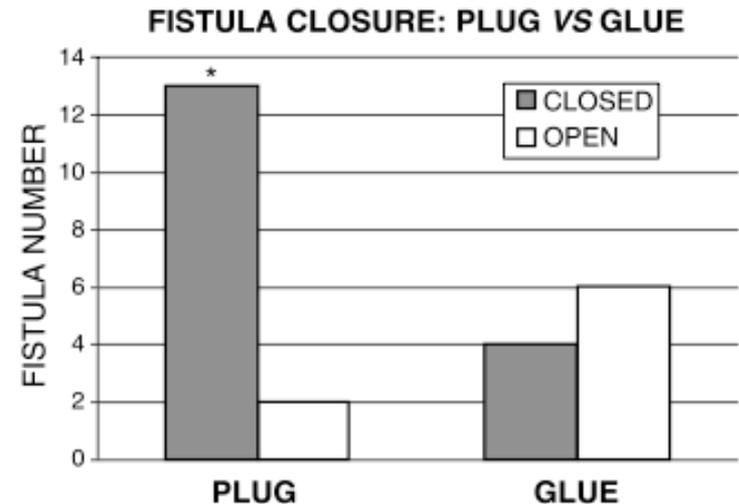


Figure 4. Open vs. closed fistulas in the anal fistula plug group vs. fibrin glue. Closure rates were significantly higher using the anal fistula plugs. * $P < 0.05$, Fisher's exact test.

N=25, 3mo f/u; 4/10 (40%) healed in glue group,
13/15 (86%) healed in plug group
All fistulae high-transphincteric or deeper

Fistula in Ano: Plug vs Advancement Flap

- ◎ RCT, multicenter: n=60
 - Primary endpoints are closure and continence rates

BMC Surgery



Study protocol

Open Access

The Anal Fistula Plug versus the mucosal advancement flap for the treatment of Anorectal Fistula (PLUG trial)

Paul J van Koperen¹, Willem A Bemelman¹, Patrick MM Bossuyt², Michael F Gerhards³, Quirijn AJ Eijsbouts⁴, Willem F van Tets⁵, Lucas WM Janssen⁶, F Robert Dijkstra⁶, Annette D van Dalsen⁷ and J Frederik M Slors*¹

Fistula prevention?

- Review of 5 RCTs that looked at fistulotomy @ primary drainage of perirectal abscess (within 3 days); n=479
- Significant heterogeneity
- 3/5 trials had reduction in recurrence with slight increase in mild incontinence (gas) not significant at 1 year

Incision and drainage of perianal abscess with or without treatment of anal fistula (Review)

Malik AI, Nelson RL, Tou S



**THE COCHRANE
COLLABORATION® 2010**

Incision and drainage of perianal abscess with or without treatment of anal fistula (Review)

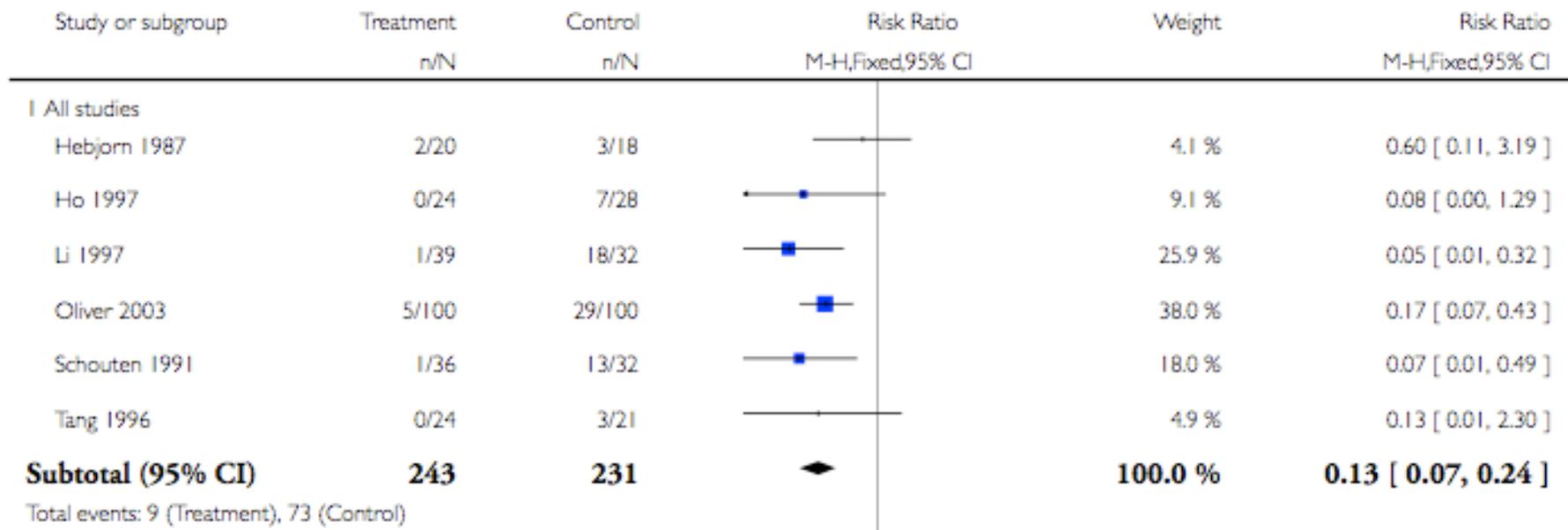
Malik AI, Nelson RL, Tou S

Analysis 1.1. Comparison 1 Incision with fistula surgery versus incision and drainage alone, Outcome 1 Recurrence, persistence or repeat surgery.

Review: Incision and drainage of perianal abscess with or without treatment of anal fistula

Comparison: 1 Incision with fistula surgery versus incision and drainage alone

Outcome: 1 Recurrence, persistence or repeat surgery



9 recurrences in treatment group vs 73 in control

LIFT (ligation of inter-sphincteric fistula tract)

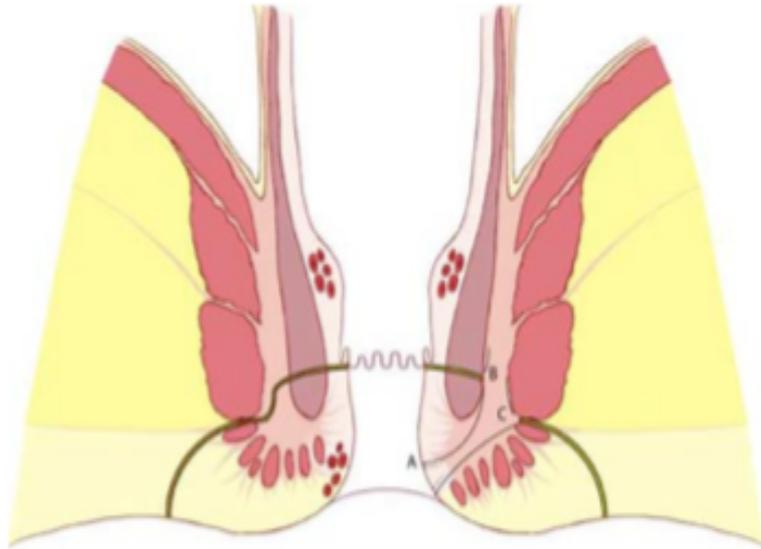


Fig. 1 Illustration showing the basic concept of the LIFT technique. **a** Approach via intersphincteric groove, **b** suture ligation of tract to close the internal opening, **c** suture ligation of defect in the external anal sphincter after removal of all infected granulation tissue



Fig. 3 Curvilinear incision of the LIFT procedure along the intersphincteric groove overlying the tract

LIFT procedure: early results

- ◎ *Shanwani et al*, Dis Colon Rectum 2010
 - n=45, 85% primary healing rate, no morbidity (incontinence)
- ◎ *Aboulian et al*, Dis Colon Rectum 2011
 - N=25, 68% primary healing rate

◎ THANK YOU

- ◎ Why are hemorrhoids called "hemorrhoids" instead of "asteroids"?
 - George Carlin

