European Society of
Human Reproduction and Embryology

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Treviso, Italy
8-9 October 2010

Female and male surgery in human reproductive medicine

Male surgical sterilization: vasectomy – techniques, outcome and follow-up by semen analyses

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Dept. Urology and Gynaecology
Sapienza University of Rome, Italy

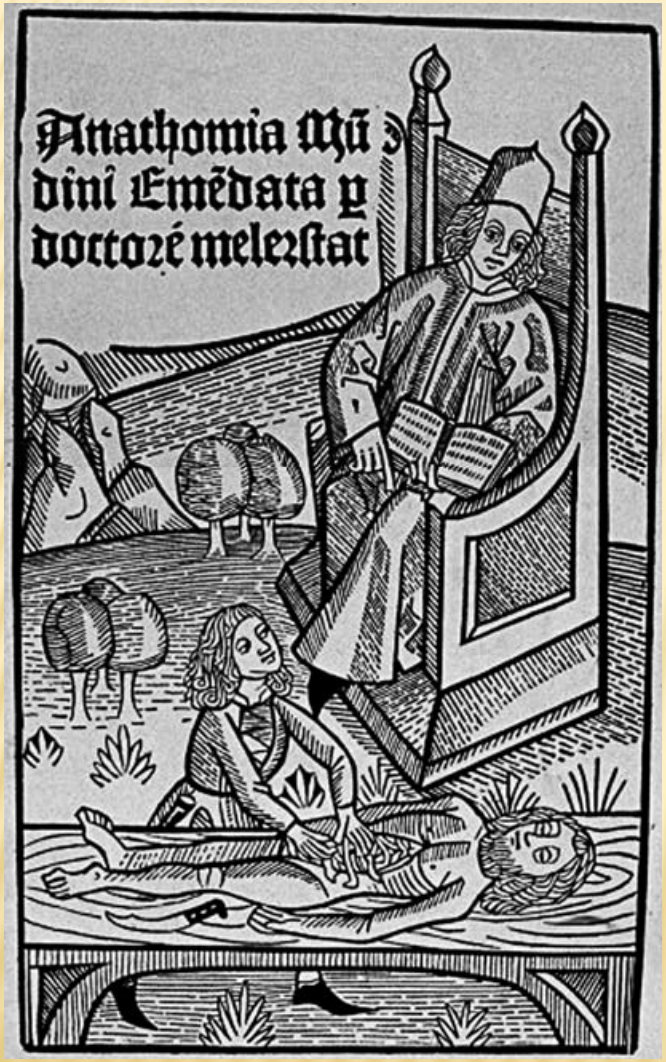
VASECTOMY IS A HISTORICAL, SOCIAL, PHILOSOPHIC, MEDICAL, DEMOGRAPHIC, AND LEGAL PHENOMENON.

Sheynkin, 2009

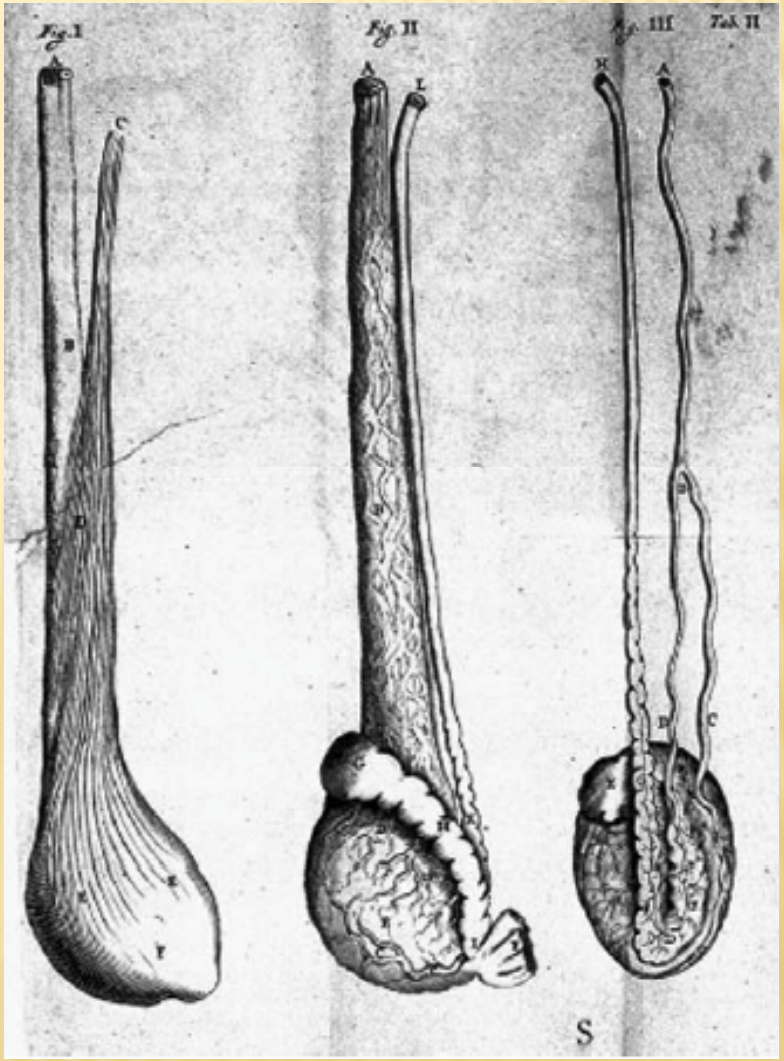
Agenda

- Historical hints
- Demographics
- Surgical techniques
- Outcome and complications
- Follow-up by semen analyses

HISTORY OF VASECTOMY



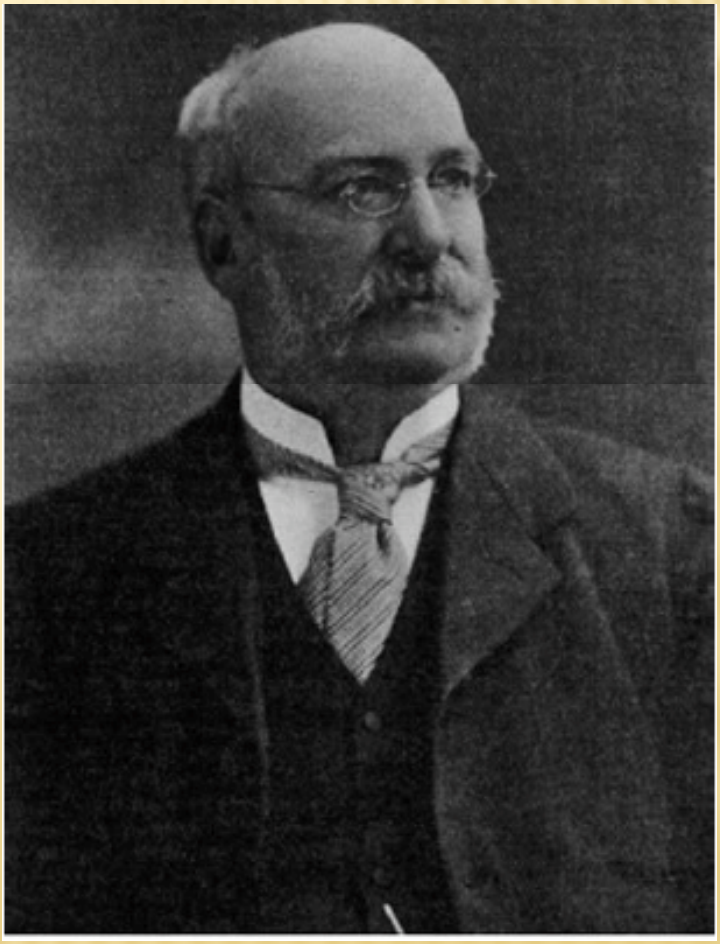
Mondino dei Liuzzi (1275-1375)



From Regnier de Graff “De virorum organis”

HISTORY OF VASECTOMY

Felix Guyon (1831-1920)
First section of vasa deferentia



Reginald Herrison (1837-1908)
100 vasectomies from 1893 to 1900

WILLIAM BELFIELD, PROFESSOR OF SURGERY AT RUSH MEDICAL COLLEGE (1909)

The reasons for surgical sterilization of men:

(1) prevention of the insane, the criminal, or the perverse from producing offspring,
(2) precarious health of the wife, which increased the risk of bearing children, and the wife being unable or refusing to undergo tubal ligation,
(3) agreement between husband and wife to prevent pregnancy,
(4) prevention of the occurrence of epididymitis, a routine procedure in many clinics in the treatment of prostatism,
(5) rejuvenation (Steinach), a false physiologic assumption and clinical failure,
(6) mass sterilization for the purpose of racial limitation

ALTHOUGH VASECTOMY IS THE SAFEST AND MOST INEXPENSIVE OPTION FOR PERMANENT STERILIZATION, FEMALE STERILIZATION IS USED ABOUT THREE TIMES AS OFTEN.

PAUL DASSOW, M.D., M.S.P.H., and JOHN M. BENNETT, M.D., M.P.H.,
University of Kentucky College of Medicine, Lexington, Kentucky

TABLE 1
Prevalence of Contraceptive Methods

Method	*Prevalence (%)**
Oral contraceptive	30.6
Female sterilization	27.0
Male condom	18.0
Vasectomy	9.2
Three-month injectable	5.3
Withdrawal	4.0
Other†	4.0
Intrauterine device	2.0

**—Reported use by couples who used contraception in 2002.*

†—Periodic abstinence, diaphragm, and other methods.

Adapted from Mosher WD, Martinez GM, Chandra A, Abma JC, Willson SJ. Use of contraception and use of family planning services in the United States: 1982-2002. Adv Data 2004;350:18.

An estimated 500.000 man undergo the procedure each year in the United States, equivalent to 11% of all married couples relying on vasectomy for contraception.

Demographics of Vasectomy—USA and International

John M. Pile, MPH*, Mark A. Barone, DVM, MS

Table 1
Worldwide use of vasectomy among married women of reproductive age (15–49), 2007

Region	Percent Married Women of Reproductive Age Using	No. of Users (Million)
Africa	~0.1	0.2
Asia	3	22.5
Latin America/Caribbean	2	1.9
Europe	3	2.9
North America	12	4.1
Oceania	10	0.5
World	2.9	32.8

Data from United Nations. World contraceptive use 2007 (wall chart). New York: United Na
and Social Affairs, Population Division; 2008; and Population Reference Bureau. Family
sheet. Washington, DC: Population Reference Bureau; 2008.

Table 2
Countries with highest vasectomy prevalence among married women of reproductive age (15–49) by region and year of survey (1991–2008)

North America / Europe / Oceania		Asia		Americas		Africa	
New Zealand (1995)	19.3	Bhutan (2000)	13.6	Puerto Rico (2002)	5.3	Namibia (2000)	0.8
Great Britain (2007/08)	16.0	Republic of Korea (1997)	12.7	Brazil (1996)	2.6	South Africa (2003)	0.7
Canada (1995)	15.2	China (2004)	6.7	Mexico (2003)	1.9	Botswana (2000)	0.2
United States (2002)	12.8	Nepal (2006)	5.0	Colombia (2004/05)	1.8	Swaziland (2006/2007)	0.2
Netherlands (1993)	10.5	Iran (2000)	2.8	Guatemala (2002)	1.0	Central African Republic (2006)	0.1
Australia (2008)	11.2	Sri Lanka (2000)	2.1	Nicaragua (2001)	0.5	Democratic Republic Congo (2001)	0.1
Spain (1999)	9.0	Myanmar (2001)	1.5	Haiti (2000)	0.4	Mauritius (2002)	0.1
Switzerland (1994/1995)	8.3	India (2005/2006)	1.0	Peru (2004/2006)	0.4	Rwanda (2007/2008)	0.1
Belgium (1991)	7.0	Thailand (2005/2006)	1.0	Uruguay (2004)	0.4	Sao Tome and Principe (2000)	0.1
Czech Republic (1997)	5.1	Bangladesh (2006)	0.6	Honduras (2005/2006)	0.3	Uganda (2006)	0.1

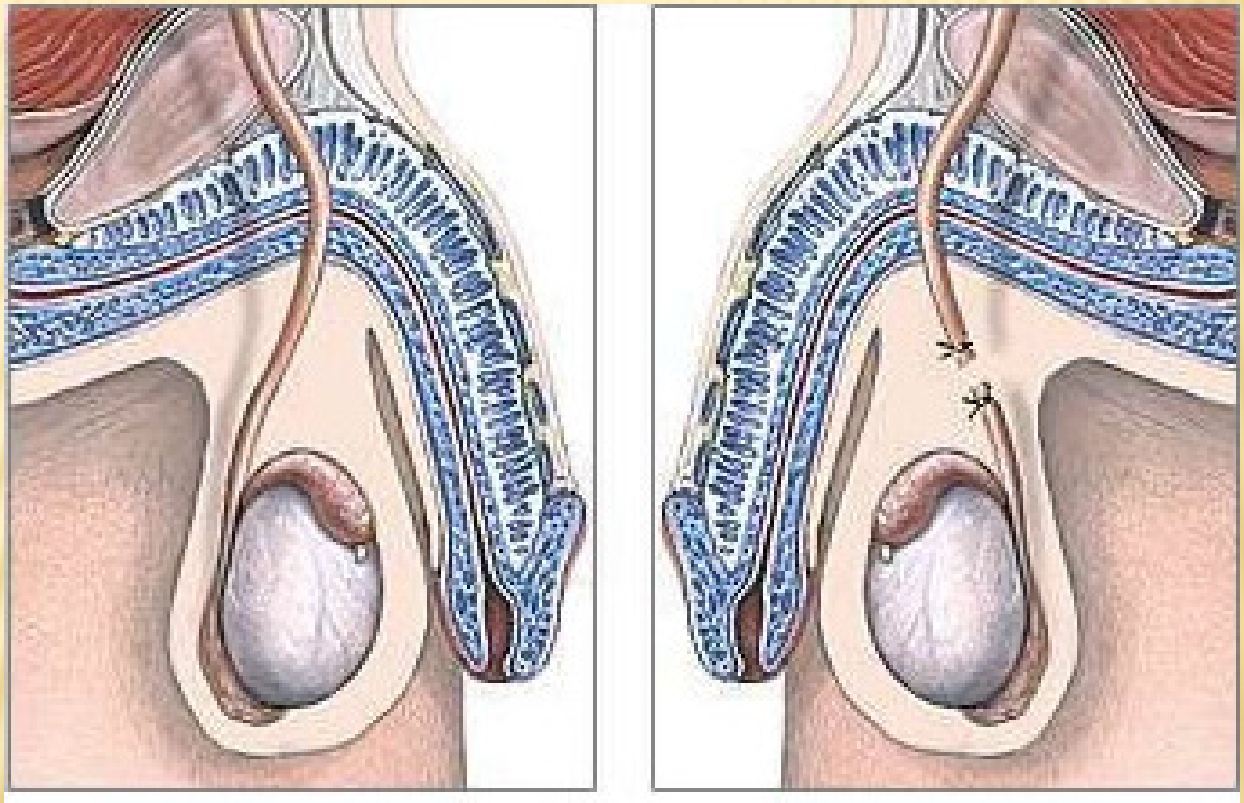
VASECTOMY IN ITALY

In Italy vasectomy is today recognized as an effective method of contraception, but still very little practiced

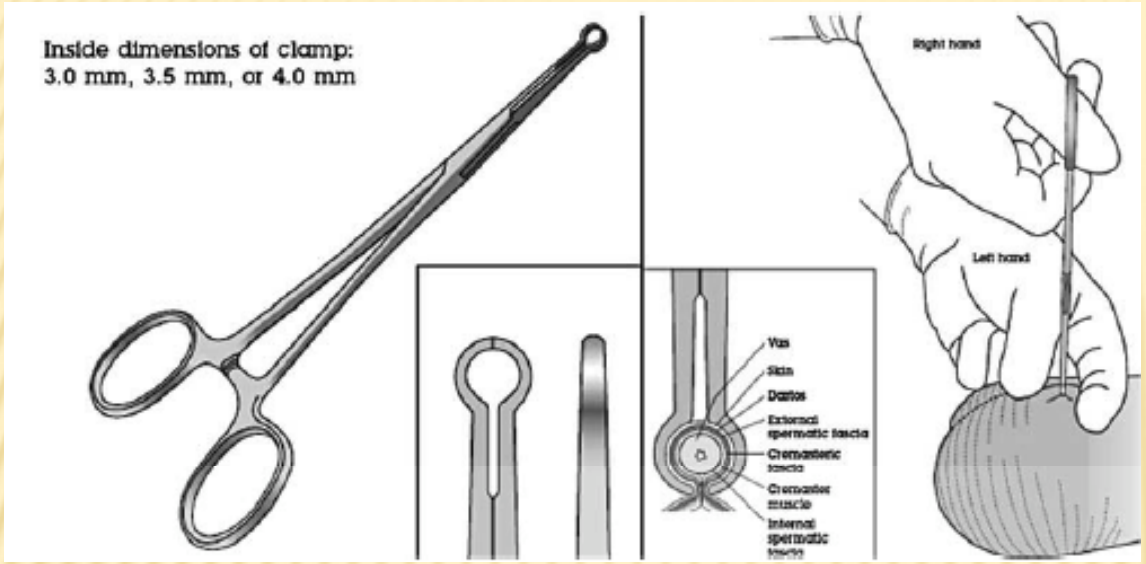
According to the online database of the Ministry of Health between 1999 and 2005, the number of hospitalizations for male sterilization were only 653

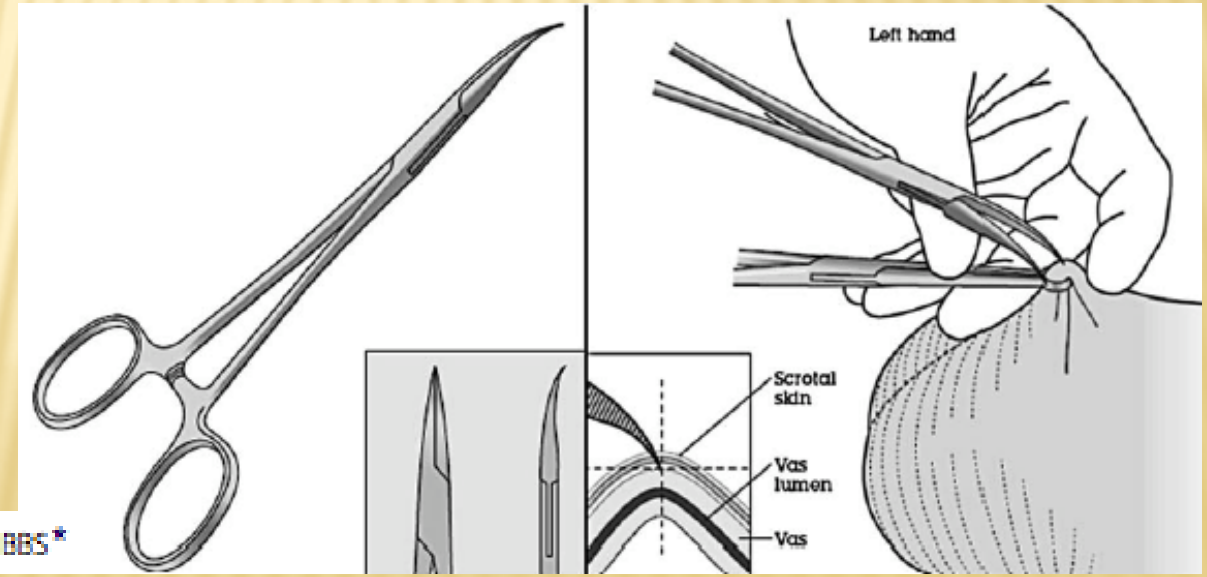
Surgery classified as vasectomy are 1717, but only 397 out of these were classified as " man sterilization“

VASECTOMY TECHNIQUES



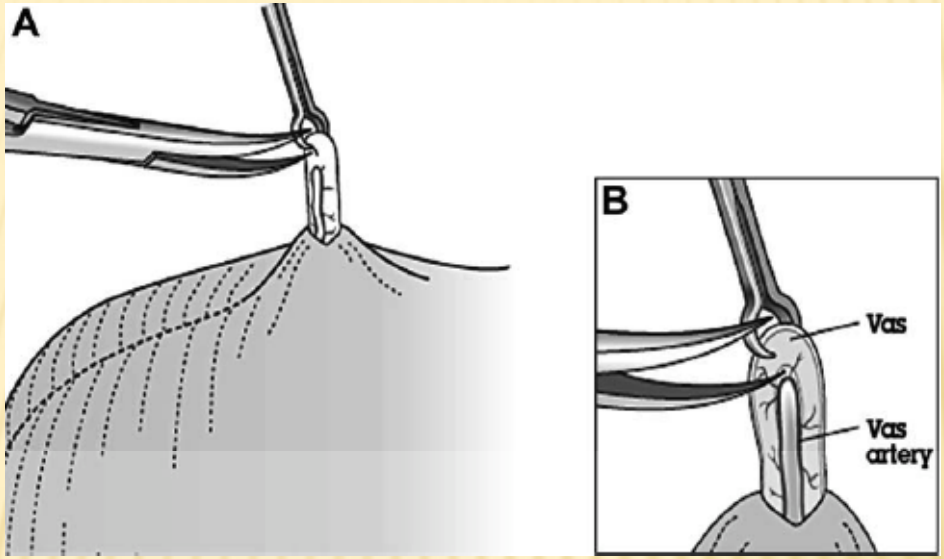
NO-SCALPEL VASECTOMY





Kevin S. Art, MD, Ajay K. Nangia, MBBS*

VASECTOMY TECHNIQUES



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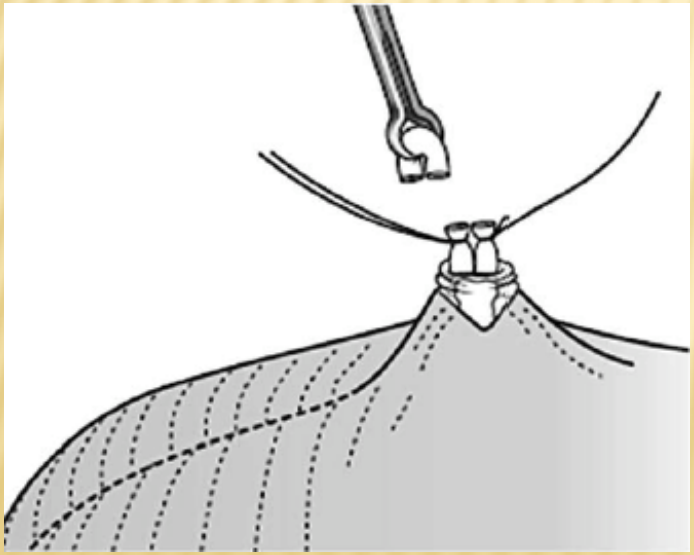
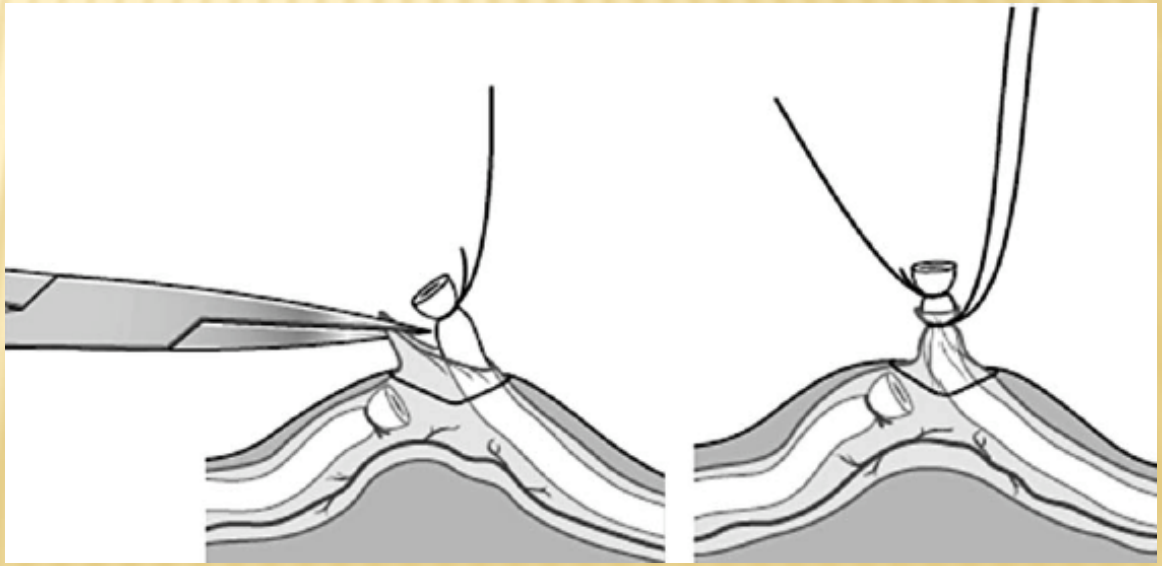
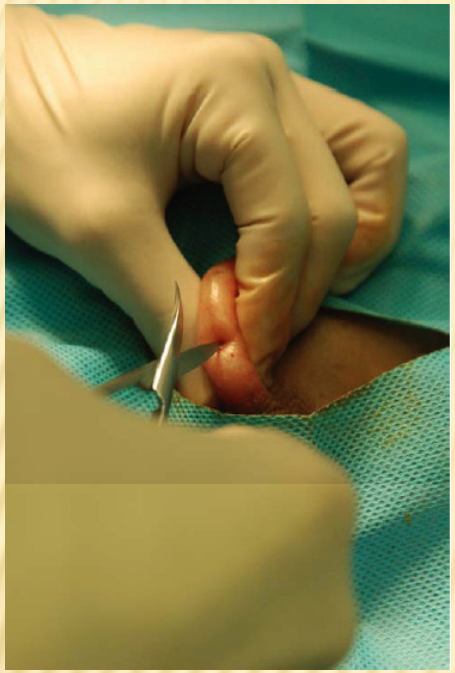




DOUBLE-RINGED CLAMP



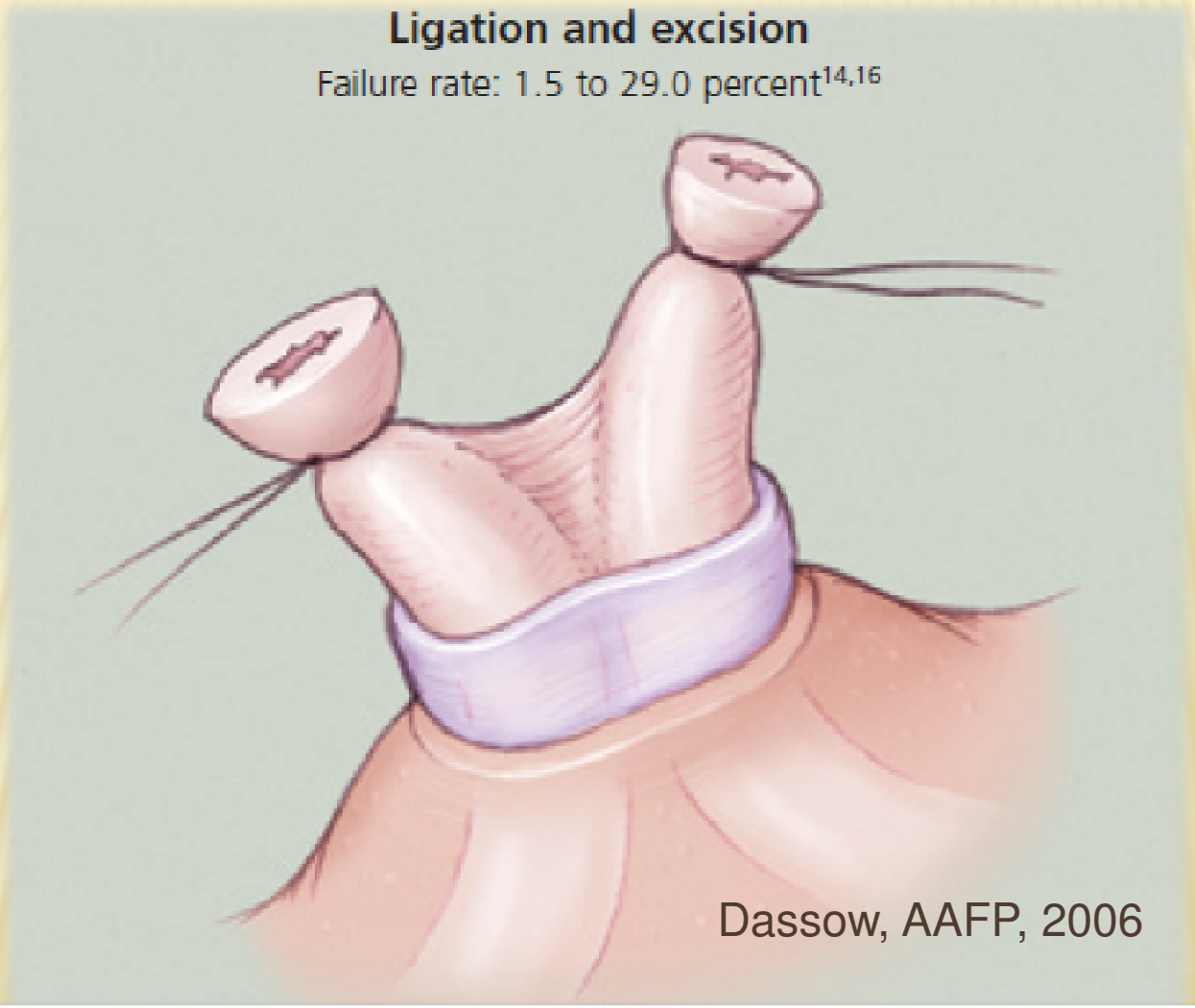
Moon's clamp

Hyun Joon Moon June 2009

VASAL DISTRUPTION METHODS FOR VASECTOMY

Ligation and excision

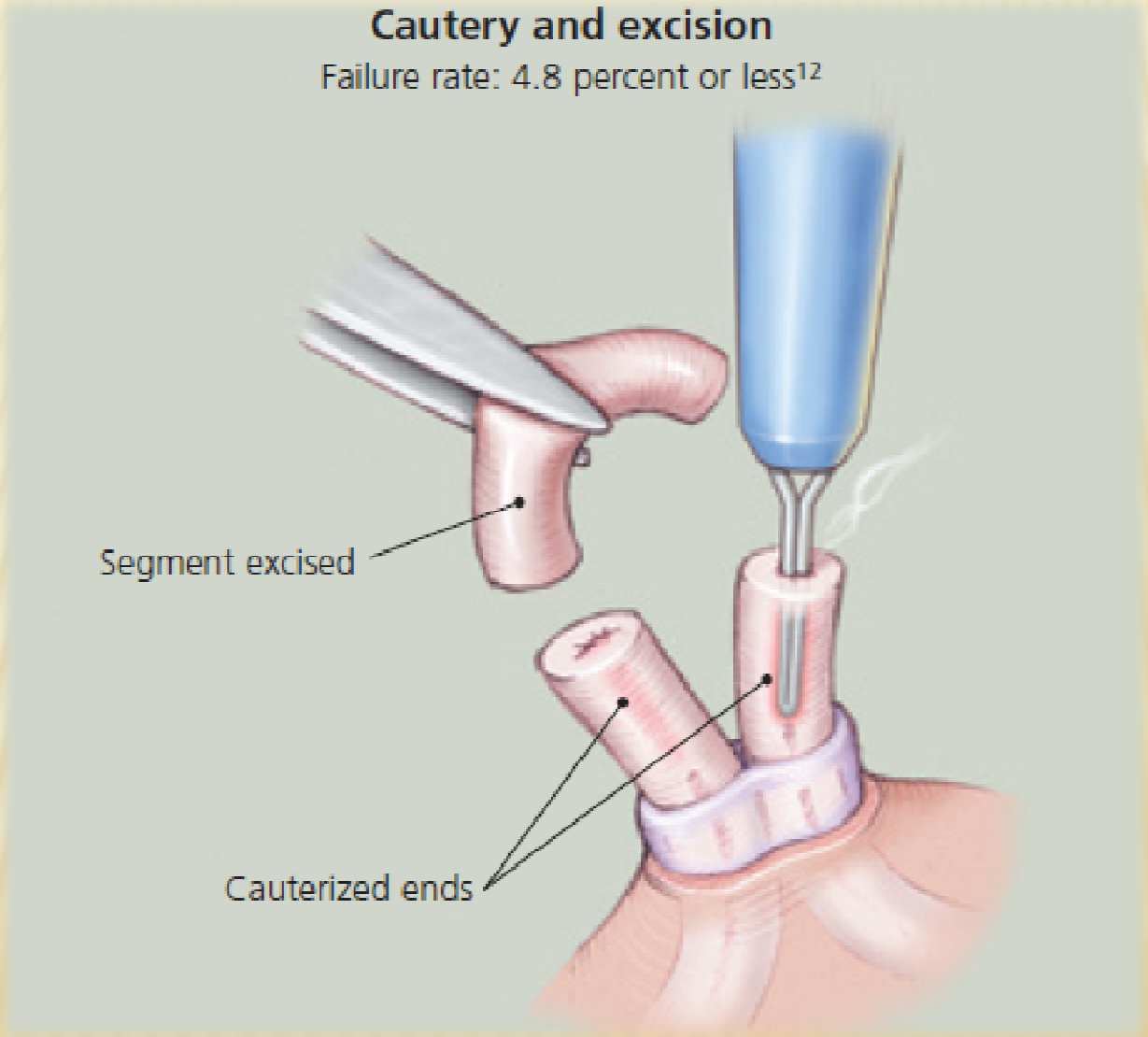
Failure rate: 1.5 to 29.0 percent[14,16]



Dassow, AAFP, 2006

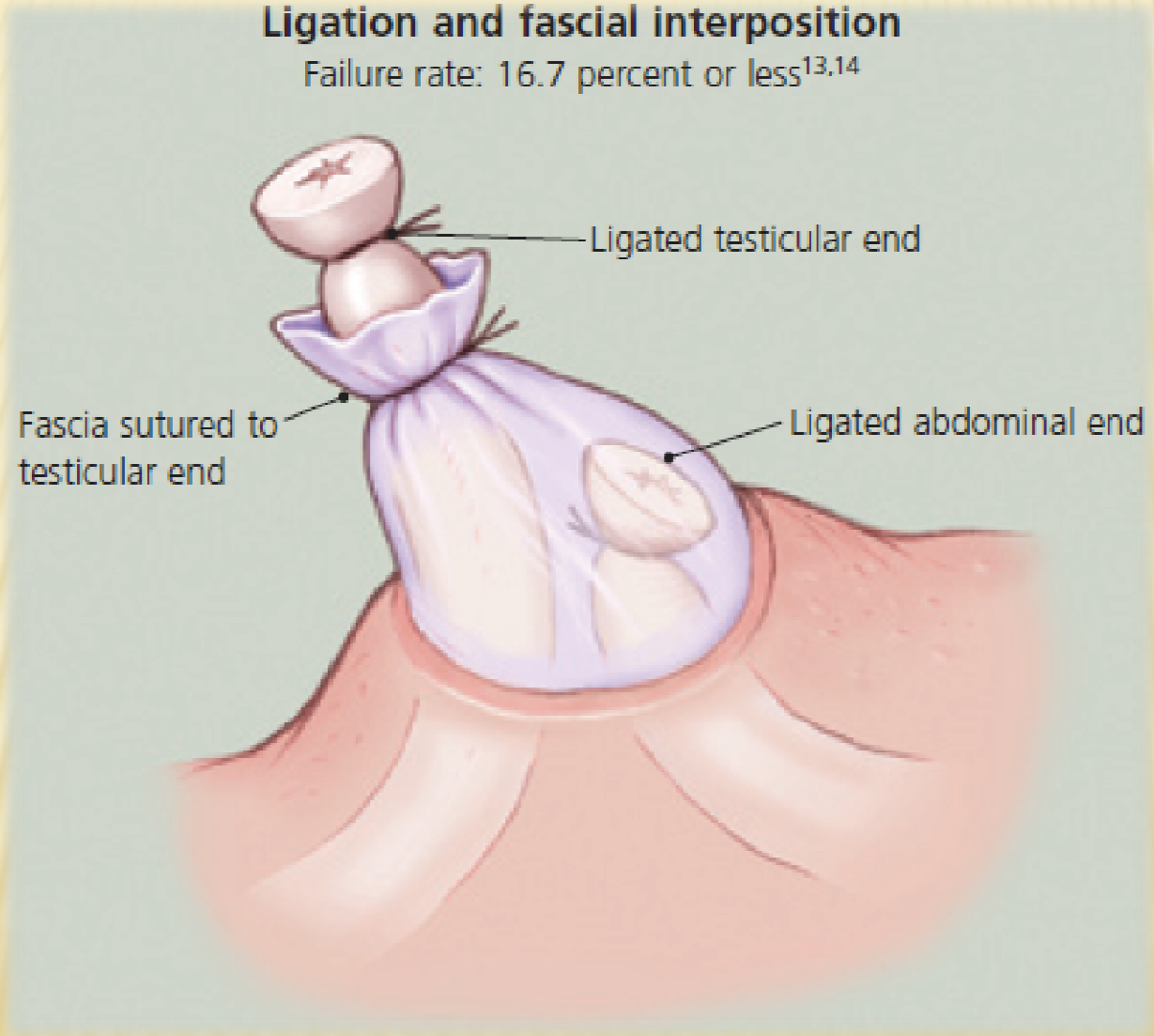
[a] Failure defined as presence of sperm.
Data from Dassow P, Bennett JM. Vasectomy: an update. Am Fam Physician 2006;74(12):2069–74.

VASAL DISTRUPTION METHODS FOR VASECTOMY



Dassow, AAFP, 2006

VASAL DISTRUPTION METHODS FOR VASECTOMY



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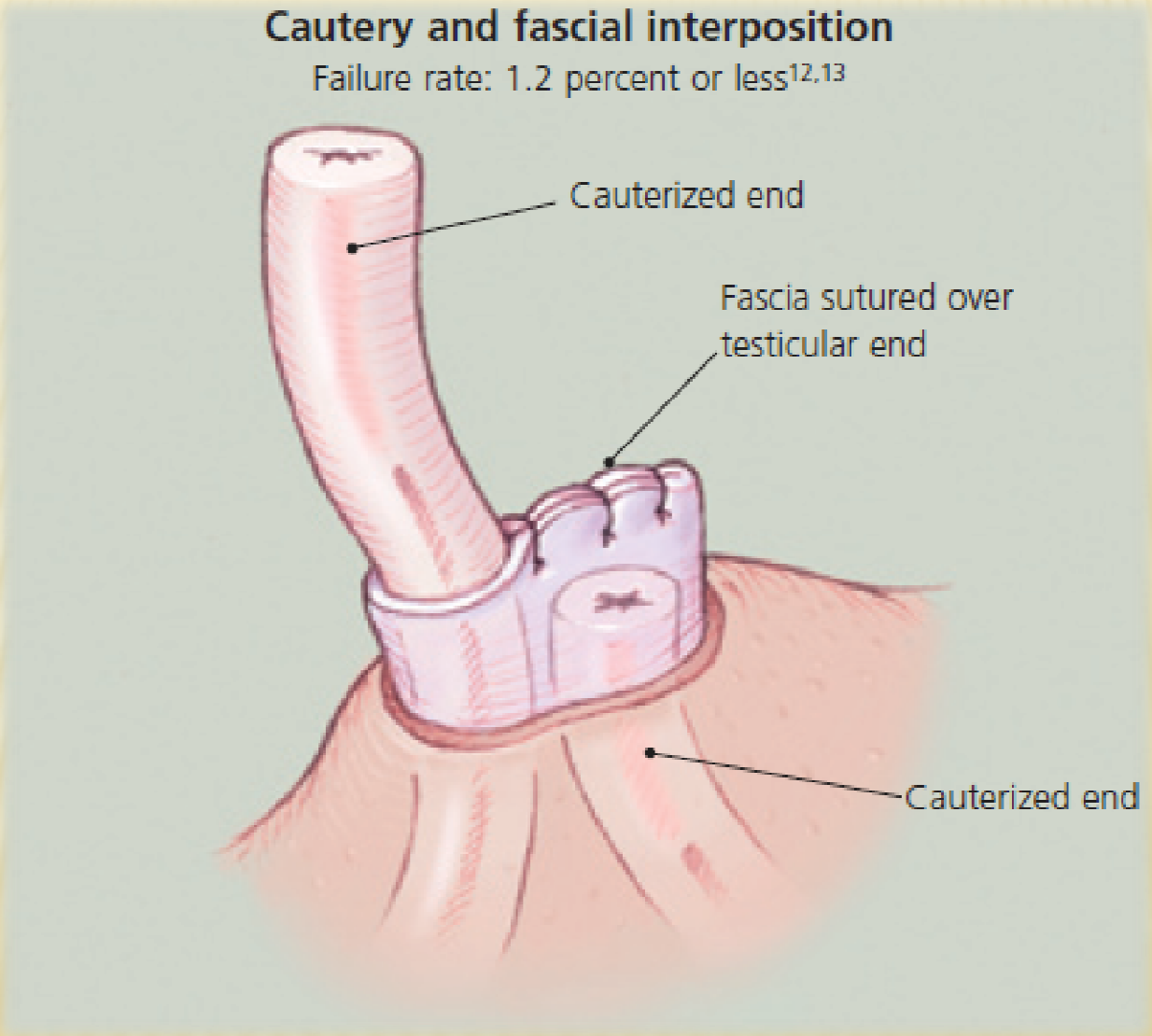

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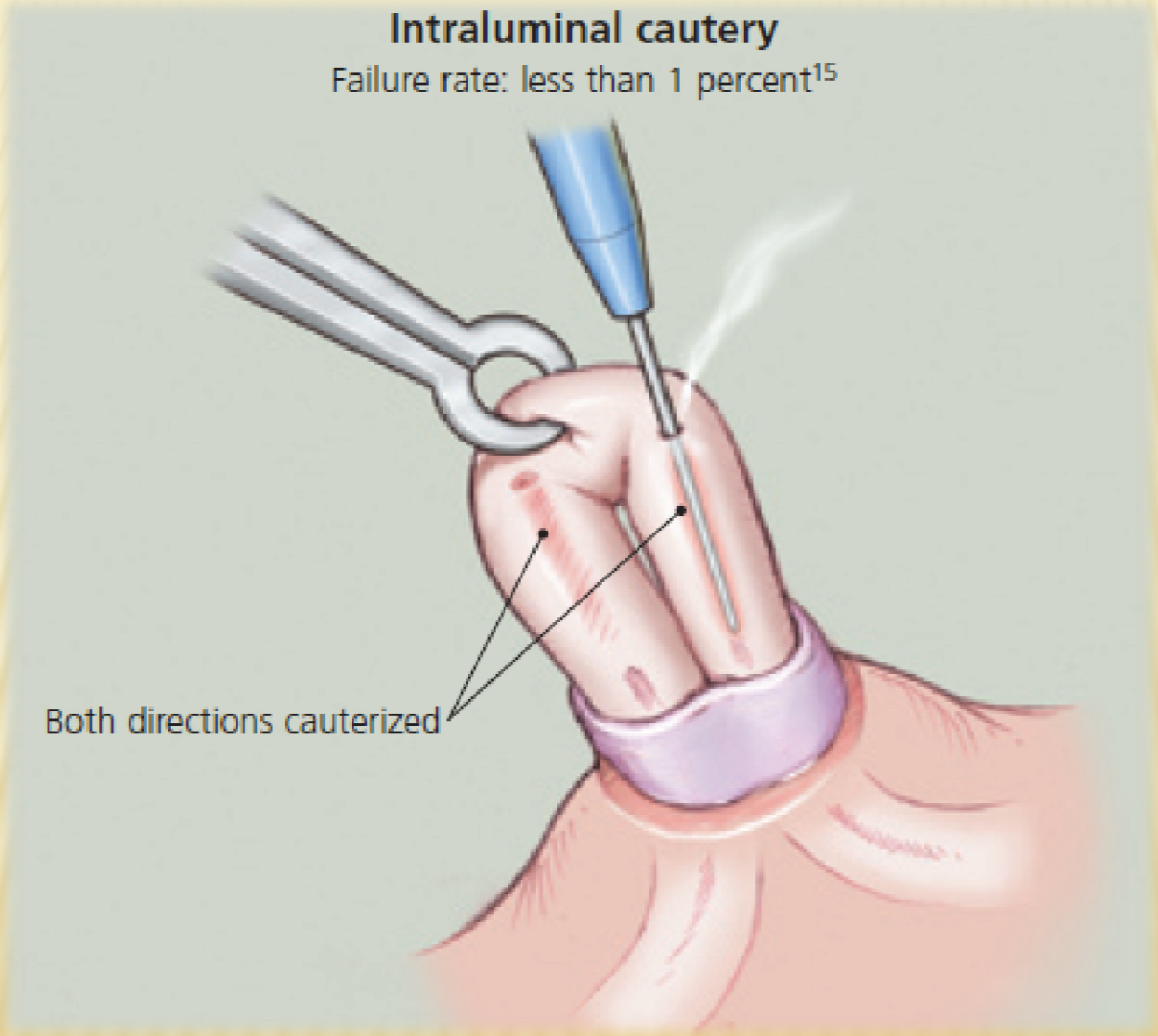

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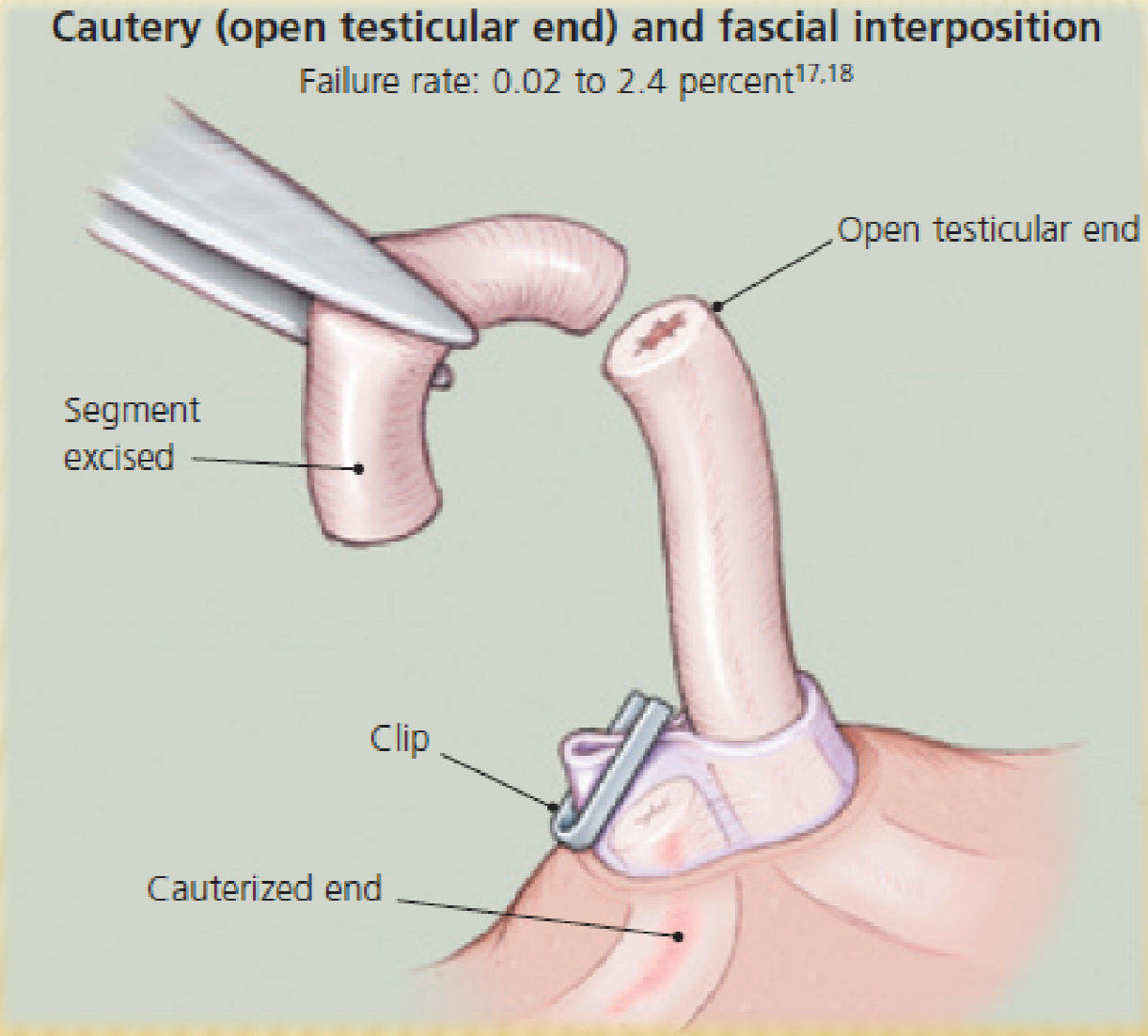


Dassow, AAFP, 2006

Minimizing Pain During Vasectomy: The Mini-Needle Anesthetic Technique

Grace Shih, Merlin Njoya, Marylène Lessard and Michel Labrecque*

From the Department of Family and Community Medicine, University of California-San Francisco (GS), San Francisco, California, and Research Centre of the Centre Hospitalier Universitaire de Québec (MN, ML) and Department of Family and Emergency Medicine, Laval University, Québec City (ML), Québec, Canada

The mini-needle technique provides excellent anesthesia for no-scalpel vasectomy.
It compares favorably to the standard vasal block and other anesthetic alternatives with the additional benefit of minimal equipment and less anesthesia.

THE JOURNAL OF UROLOGY®

SCALPEL AND NO-SCALPEL APPROCH

Men who received the no-scalpel method had less bleeding, hematoma, infection and pain during surgery and follow up, but they had more surgical difficulties than those who had the incisional method.

Despite having more surgical difficulties (i.e.,short scrotum or thin deferens, adhesions and difficulties isolating the vas),the no-scalpel group required a shorter operation time.

SCALPEL AND NO-SCALPEL APPROACH

Men who had the no-scalpel technique also had a quicker resumption of sexual activity.

These findings are consistent with results from large, non-randomized studies that have documented fewer hematomas and infection, as well as a shorter operation time, with the no-scalpel than with the scalpel approach.

RISKS AND COMPLICATIONS OF VASECTOMY

- VASECTOMY FAILURE
- HEMATOMA FORMATION
- POSTVASECTOMY PAIN
- SPERM GRANULOMA
- INFECTION
- IMMUNOLOGIC EFFECT OF VASECTOMY
- ? RISK OF DEVELOPING NEOPLASIAS

RISKS AND COMPLICATIONS OF VASECTOMY

Vasectomy and Risk of Prostate Cancer

Sarah K. Holt[1], Claudia A. Salinas[1,2], and Janet L. Stanford[1,2]
1 *Division of Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, WA*
2 *Department of Epidemiology, University of Washington, Seattle, WA*

Conclusions—These findings indicate there is no association between vasectomy and risk of prostate cancer.

J Urol. Author manuscript; available in PMC 2009 December 1.

Vasectomy and Prostate Cancer

Reviewed by Masood A. Khan, MD, Alan W. Partin, MD, PhD
The Johns Hopkins Hospital, Baltimore, MD

[*Rev Urol*. 2004;6(1):46–47]

Vasectomy and Risk of Prostate Cancer

Cox B, Sneyd MJ, Paul C, et al.

JAMA. 2002;287:3110–3115.

Results demonstrated no association between prostate cancer and vasectomy or time since vasectomy.

Putative Health Risks Associated with Vasectomy

Tobias S. Köhler, MD, MPH[a], Anees A. Fazili, MD[b], Robert E. Brannigan, MD[b,*]

Risk of testicular cancer after vasectomy: cohort study of over 73 000 men

Henrik Møller, Lisbeth B Knudsen, Elsebeth Lynge

***Conclusions*—The incidence of testicular cancer in men with vasectomy is no higher than in other men. Vasectomy does not cause testicular cancer and does not accelerate the growth or diagnosis of pre-existing testicular neoplasms. Data concerning a causal relation between vasectomy and prostate cancer were inconclusive.**

BMJ VOLUME 309 30 JULY 1994

Effectiveness of Vasectomy Techniques

David C. Sokal, MD[a,*], Michel Labrecque, MD, PhD[b]

Table 1
Possible postvasectomy occlusive outcomes

Success
"Normal" success (see Fig. 1, cases 1 to 3)
Transient early recanalization
Success before first PVSA (subclinical recanalization) (see Fig. 2, cases 5 and 6)
Success after first PVSA (delayed success) (see Fig. 2, case 7)
Failure
Technical/surgical error (see Fig. 1, case 4)
Persistent early recanalization (see Fig. 2, case 8)
Late failure
Persistent late recanalization
Transient late recanalization

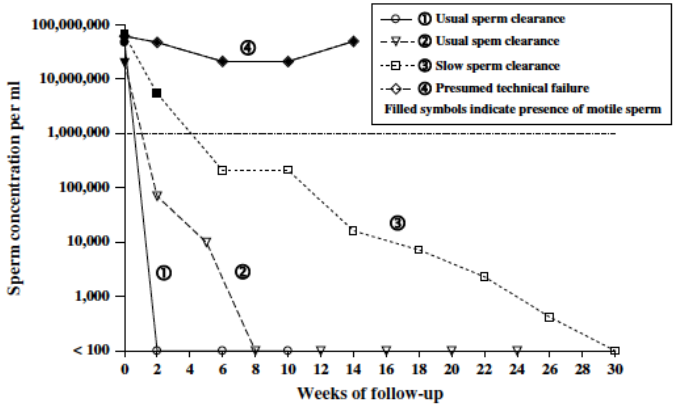


Fig. 1. Semen analysis charts of four men who did not have presumed early recanalization. Sperm concentration is illustrated on a logarithmic scale. Because a logarithmic scale has no true zero, <100 on the graph was used to indicate azoospermia. The dotted line indicates low sperm cutoff (1,000,000 sperm/mL) according to reviewers' consensus. For case 2, prevasectomy sperm concentrations were not available. A count of 20,000,000 sperm/mL with presence of motile sperm was assumed. (*From* Labrecque M, Hays M, Chen-Mok M, et al. Frequency and patterns of early recanalization after vasectomy. BMC Urol 2006;6:25; under a Creative Commons license, http://creativecommons.org/licenses/by/2.0/; with permission.)

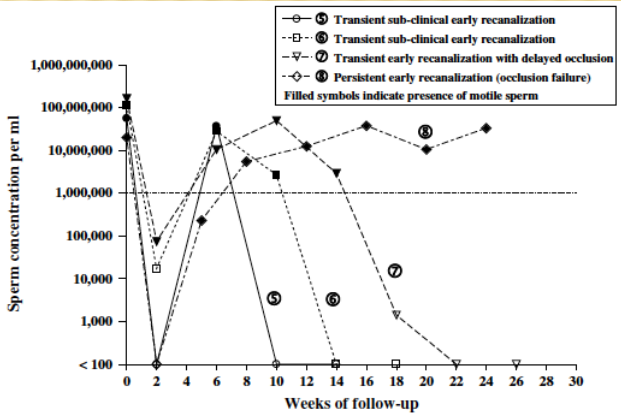


Fig. 2. Semen analysis charts of four men who had presumed early recanalization. Sperm concentration is illustrated on a logarithmic scale. Because a logarithmic scale has no true zero, <100 on the graph was used to indicate azoospermia. The dotted line indicates low sperm cutoff (1,000,000 sperm/mL) according to reviewers' consensus. For case 8, prevasectomy sperm concentrations were not available. A count of 20,000,000 sperm/mL with presence of motile sperm was assumed. (*From* Labrecque M, Hays M, Chen-Mok M, et al. Frequency and patterns of early recanalization after vasectomy. BMC Urol 2006;6:25; under a Creative Commons license, http://creativecommons.org/licenses/by/2.0/; with permission.)

FOLLOW-UP BY SEMEN ANALYSES

- Different follow-up protocols proposed
- Most universally accepted:

  2 Semen analysis showing azoospermia or cryptozoospermia 2-4 months after surgery

BJUI

Clearance after vasectomy with a single semen sample containing < than 100 000 immotile sperm/mL: analysis of 1073 patients

Ruben A. Korthorst, Dimitri Consten* and J. Herman van Roijen

*Department of Urology, and *IVF Laboratory, St. Elisabeth Hospital, Tilburg, the Netherlands*

Accepted for publication 12 August 2009

The patients can be cleared after a single semen sample containing <100.000 immotile sperm/mL at >3 months after vasectomy. This protocol is safe and dramatically reduces the number of men who cannot be cleared at 3 months after vasectomy.

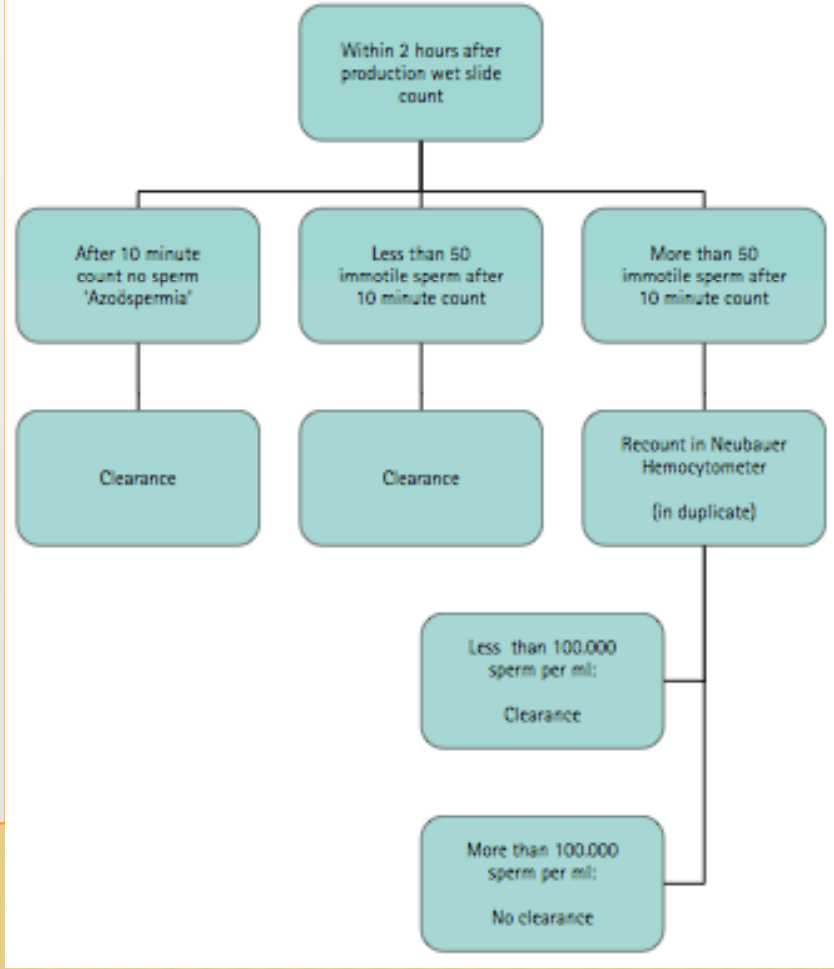


FIG. 1. A flowchart depicting the semen analysis protocol after vasectomy. Semen was analysed at ≥3 months after vasectomy.

Infertility

Intraoperative Distal Vasal Flushing—Does It Improve the Rate of Early Azoospermia Following No-scalpel Vasectomy? A Prospective, Randomized, Controlled Study

Dharamveer Singh, Nandan S. Dasila, Pawan Vasudeva, Divakar Dalela, Satyanarayan Sankhwar, Apul Goel, Vishwajeet Singh, Anjana Singh, Abhishek Jain, Bhupendra P. Singh, and Nisar Ahmed

"Distal vasal flushing with 30 mL of sterile water may shorten the time to azoospermia for between 20% and 30% of vasectomy patients.

Thus, this procedure may be an option to reduce the long duration of postvasectomy alternative contraceptive methods"

UROLOGY 2010

Are Sexual Problems More Common in Men who have had a Vasectomy? A Population-Based Study of Australian Men

Anthony Smith, PhD,* Anthony Lyons, PhD,* Jason Ferris, MbioStats,* Juliet Richters, PhD,† Marian Pitts, PhD,* and Julia Shelley, PhD*‡

*Australian Research Centre in Sex, Health, and Society (ARCSHS), La Trobe University, Melbourne, Australia; †School of Public Health and Community Medicine, University of New South Wales, Sydney, Australia; ‡School of Health and Social Development, Deakin University, Melbourne, Australia

Sexual problems are no more prevalent among vasectomized men than they are among nonvasectomized men.

Table 2 Association between having had a vasectomy and reporting sexual problems for a period of 1 month or more during the last 12 months

	Had a vasectomy		Unadjusted	Adjusted*
	No N = 1,792	Yes N = 772	OR (95% CI)	OR (95% CI)
	%	%		
Lacked interest having sex	18.9	16.2	0.84 (0.66, 1.05)	0.83 (0.65, 1.06)
Was unable to reach orgasm	4.2	4.6	1.08 (0.72, 1.63)	0.86 (0.55, 1.32)
Came to orgasm too quickly	12.8	13.8	1.09 (0.84, 1.40)	1.01 (0.77, 1.34)
Took too long to reach orgasm	5.8	6.1	1.05 (0.72, 1.51)	1.09 (0.73, 1.63)
Experienced physical pain during sex	1.5	2.1	1.46 (0.79, 2.69)	1.90 (0.95, 3.81)
Did not find sex pleasurable	3.3	2.9	0.86 (0.52, 1.44)	0.77 (0.45, 1.33)
Was anxious about sexual performance	10.6	10.1	0.94 (0.71, 1.26)	0.83 (0.61, 1.13)
Had problems maintaining an erection	8.2	10.8	1.35 (1.00, 1.83)	1.06 (0.76, 1.47)

*Adjusted for all significant socio-demographic differences between vasectomized and nonvasectomized men.
CI = confidence interval; OR = odds ratio.

CONCLUSIONS

- Vasectomy is an efficient technique but is still to be considered a “permanent” contracceptive method
- Recanalization is the most common reason for vasectomy failure (evidence level B)
- Simple ligation and excision, with suture material (evidence level A) or surgical clips (evidence level B), are associated with an high risk for failure

CONCLUSIONS

- Adding FI to ligation and excision significantly reduces the risk for failure (evidence level A).
- Techniques that include cautery seem to have a lower risk for failure than techniques that do not include cautery (evidence level B). There is insufficient evidence to recommend a particular standardized cautery technique, but adding FI to cautery seems to be associated with the lowest risk for failure.
- Open-ended vasectomy does not increase the risk for failure when the prostatic end is adequately closed using FI and cautery (evidence level B).

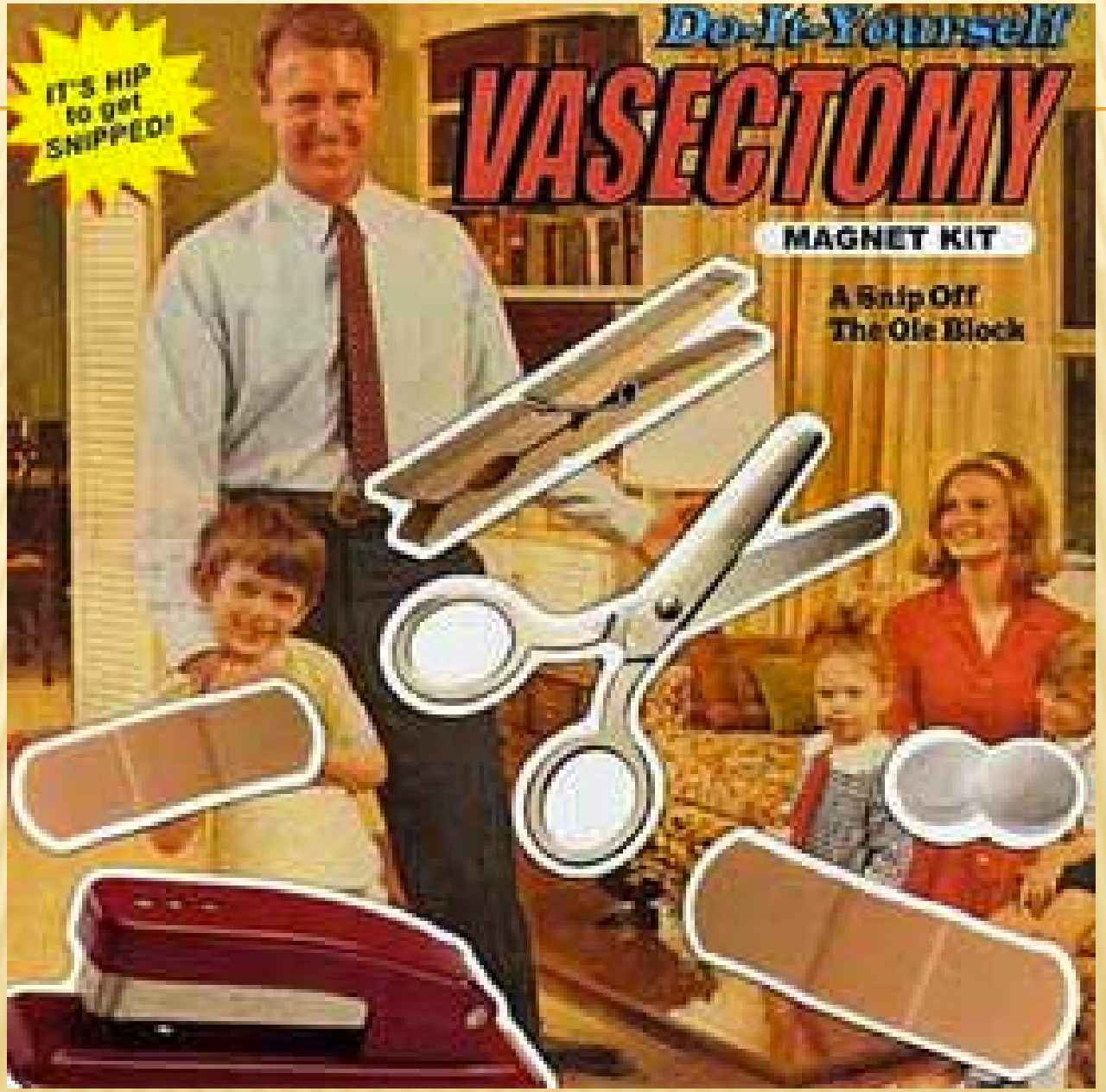
CONCLUSIONS

Additional research is needed to:

a) clarify the importance of including FI with thermal or electrical cautery (a randomized controlled trial of the Indian Council of Medical Research is ongoing)

b) document any potential benefits of the open-ended technique

c) explore new ideas for quicker and easier methods of vas occlusion.


IT'S HIP
to get
SNIPPED!
Do-It-Yourself
VASECTOMY
MAGNET KIT
A Snip Off
The Ole Block

Vasectomy: our latest, fast and radical technique……

Thank you !!!