

# CHRONIC SCROTAL PAIN: WHAT WE AS UROLOGISTS CAN OFFER

Urology Grand Rounds

May 4, 2016

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## Objectives

- Review the definition, epidemiology and etiology of chronic scrotal pain (CSP)
- Outline basic management of patients with CSP
- Examine current literature for the surgical management of CSP focusing primarily on microsurgical spermatic cord denervation

## Definitions

- **Chronic Orchialgia:** intermittent or constant, unilateral or bilateral testicular pain lasting for more than 3 months<sup>1</sup>.
- **Chronic Scrotal Content Pain:** Chronic orchialgia that also includes pain localized to the epididymis, vas deferens, or paratesticular structures<sup>2</sup>
- **Scrotal pain syndrome:** the occurrence of persistent or recurrent episodic pain localised within the organs of the scrotum, and may be associated with symptoms suggestive of urinary tract or sexual dysfunction. There is no proven infection or other obvious local pathology. Scrotal pain syndrome is often associated with negative cognitive, behavioural, sexual or emotional consequences, as well as with symptoms suggestive of lower urinary tract and sexual dysfunction. Scrotal pain syndrome is a generic term and is used when the **site of the pain is not clearly testicular or epididymal**. The pain is not in the skin of the scrotum as such, but perceived within its contents, in a similar way to idiopathic chest pain<sup>3</sup>

<sup>1</sup>Davis, B. J Urol 1990

<sup>2</sup>Levine, L. Curr Urol Rep 2015

<sup>3</sup>Engeler, D et al. Eur Urol 2013

## Definitions: EUA Guidelines 2013

- **Testicular pain syndrome:** is the occurrence of persistent or recurrent episodic pain perceived in the testes, and may be associated with symptoms suggestive of urinary tract or sexual dysfunction. There is no proven infection or other obvious local pathology. Testicular pain syndrome is often associated with negative cognitive, behavioural, sexual or emotional consequences, as well as with symptoms suggestive of lower urinary tract and sexual dysfunction. Previous terms have included orchitis, orchialgia and orchiodynia. These terms are no longer recommended
- **Epididymal pain syndrome:** is the occurrence of persistent or recurrent episodic pain perceived in the epididymis, and may be associated with symptoms suggestive of urinary tract or sexual dysfunction. There is no proven infection or other obvious local pathology. Epididymal pain syndrome is often associated with negative cognitive, behavioural, sexual or emotional consequences, as well as with symptoms suggestive of lower urinary tract and sexual dysfunction.
- **Postvasectomy scrotal pain syndrome:** is a scrotal pain syndrome that follows vasectomy. Postvasectomy scrotal pain syndrome is often associated with negative cognitive, behavioural, sexual or emotional consequences, as well as with symptoms suggestive of lower urinary tract and sexual dysfunction. Postvasectomy pain may be as frequent as 1% following vasectomy, possibly more frequent. The mechanisms are poorly understood and it is for that reason considered a special form of scrotal pain syndrome.

Engeler, D et al. Eur Urol 2013

## Epidemiology

- 350-400 cases per 100,000 men per year (65,000 men per year in Canada)
- ~1% of men with chronic scrotal pain undergo surgical intervention
- Age range: 35-50
- Nearly 2.5% of urology office visits are related to chronic scrotal pain
- Patients with CSP often see multiple urologists
- >4 diagnostic tests per patient
- Significant cost to healthcare system

## Quality of life

- ...often associated with negative cognitive, behavioural, sexual or emotional consequences<sup>1</sup>
- Sexual side effects<sup>2</sup>
- Patients with orchialgia had decreased scores in:
  - orgasmic function
  - intercourse satisfaction
  - sexual desire
  - overall sexual satisfaction
  - and total IIEF scores
- No difference in Erectile function

<sup>1</sup>Engeler, D et al. Eur Urol 2013  
<sup>2</sup>Ciftci, H et al. Arch Sex Behav 2011

# Etiology

## Scrotal

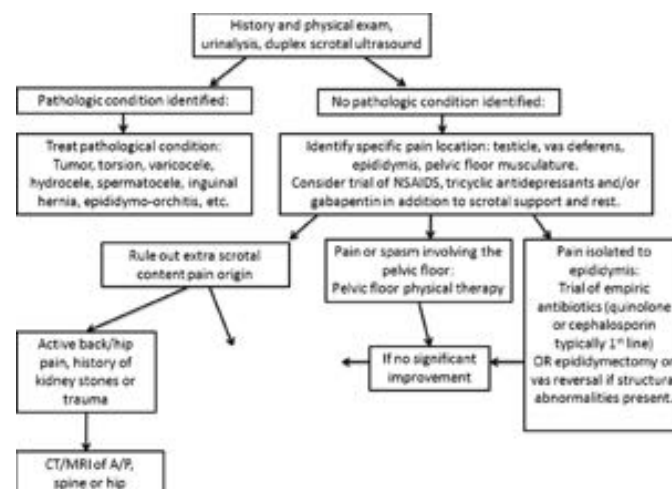
- Post vasectomy pain (up to 15%)
- Varicocele
- Spermatocele
- Hydrocele
- Infection
- Tumor
- Intermittent torsion
- Prior scrotal surgery
- Medications – Amiodarone induced epididymitis

❖ Up to 50% of chronic scrotal pain is idiopathic

## Extrascrotal

- Anything along the course of the ilioinguinal or genitofemoral nerves
- Inguinal hernia / post hernia repair
- Peritonitis
- Urolithiasis
- Retroperitoneal tumors
- Diabetic neuropathy
- MSK pain (back, hip)
- Polyarteritis nodosa
- Henoch Schonlein Purpura
- Abdominal aortic aneurysm
- Pelvic floor myalgia/spasm

# Chronic Scrotal Pain Treatment Algorithm



Levine L and Hoeh H. Curr Urol Rep 2015

## Conservative Treatment Options

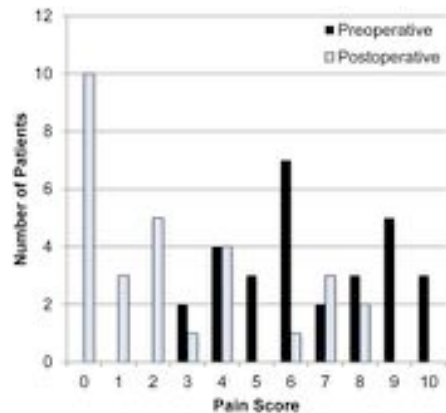
- Rest, Ice, scrotal support
- Pain education, counselling
- NSAIDs
- TCAs or Gabapentin<sup>†</sup>
- Antibiotics for chronic epididymitis
- Acupuncture
- Pelvic floor therapy
- Spermatic cord local steroid injections
- Transcutaneous electrical nerve stimulation (TENS)

<sup>†</sup>Sinclair A et al. Int J Urol 2007

## Treatment for identifiable causes: Post vasectomy pain

- Vasovasostomy or vasoepididymostomy
- 31 men median age 38
- 34% reported complete resolution of pain
- 82% reported improvement in pain
- Mean VAS scores: pre 6.6 post 1.2
- 4 repeat procedures

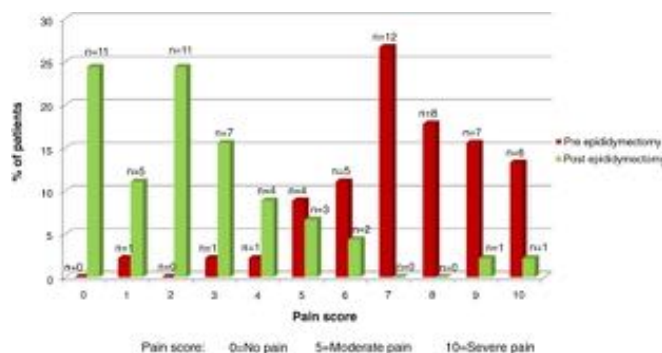
Vasovasostomy is effective in post-vasectomy pain	2b
Inform about the risk of post-vasectomy pain when counselling patients planned for vasectomy.	A



Polackwich A et al, Urology 2015

## Treatment for identifiable causes: Post vasectomy pain

- Epididymectomy
- 45 patients
- Mean follow up 7.4 years
- Mean pain scores
  - pre op 7.3
  - Post op 2.4
- Satisfaction rate 93%



Hori Set al. J Urol 2009

## Treatment for identifiable causes: Epididymal pain

- Epididymectomy
- 53 patients
- Mean age 53
- Mean follow up 4.2 years
- Review of literature
  - Satisfaction rates
    - Post vasectomy 83%
    - Chronic Epididymitis 57%
    - Painful epididymal cyst 80%

	Post Vasectomy	Chronic Epididymitis (no vasectomy)	Epididymal cyst (no vasectomy)
# of pts	18	21	14
Mean VAS pain score			
pre operative	6.78	7.0	6.93
post operative	0.94	2.9	1.71
Change in VAS	5.38	4.1	5.21

Lee J et al. Urology 2010

## Treatment for identifiable causes: Varicocele

- 48 patients
- Mean age 38 years
- Mean follow up 20 months
- 42 patients (87.5%) noted significant improvement (>50% reduction) in the visual analog scale score
- 5 recurrences (10.4%)
- De novo hydrocele formation in 4 patients (8.3%).

	Grade 1	Grade 2	Grade 3	All
No. of patients	1	20	27	48
Mean VAS pain score				
Pre operative	4	4.73	4.87	4.8
Post operative	0	0.94	0.76	0.8
P value		<0.001	<0.001	<0.001

Kachrilas Setal, JSLS 2014

## Orchiectomy

- No recent studies
- Old studies show success rates of 20 – 80%
- Inguinal approach appears to show better results than scrotal approach
- Psychological impact with loss of testis

Orchiectomy is the last resort in treating scrotal pain syndrome.	4
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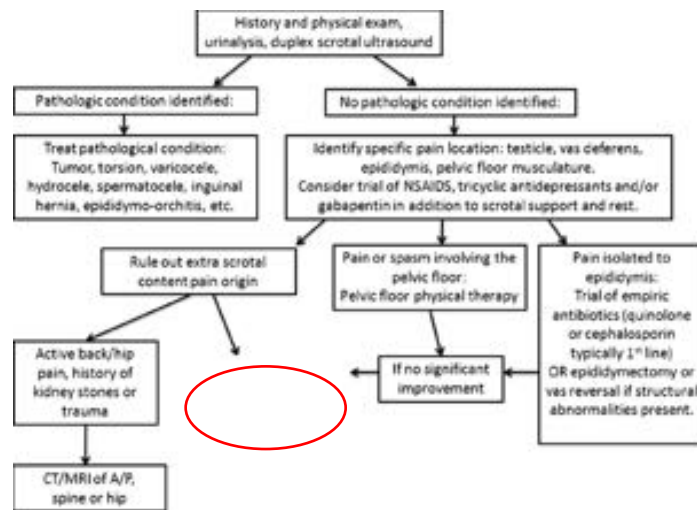
We recommend that orchiectomy should not be done, unless all other therapies, including pain management assessment, have failed.	C
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Engeler, D et al. Eur Urol 2013

But what if that doesn't work?



## Chronic Scrotal Pain Treatment Algorithm



Levine L and Hoeh H. Curr Urol Rep 2015



## Chronic pain

- Pain is not static or passive
- Pain response to stimuli is a continuum based on reactions of neurons to changes in their environment
- Abnormalities in neuronal plasticity can lead to chronic pain



Woolf C et al. Science 2000

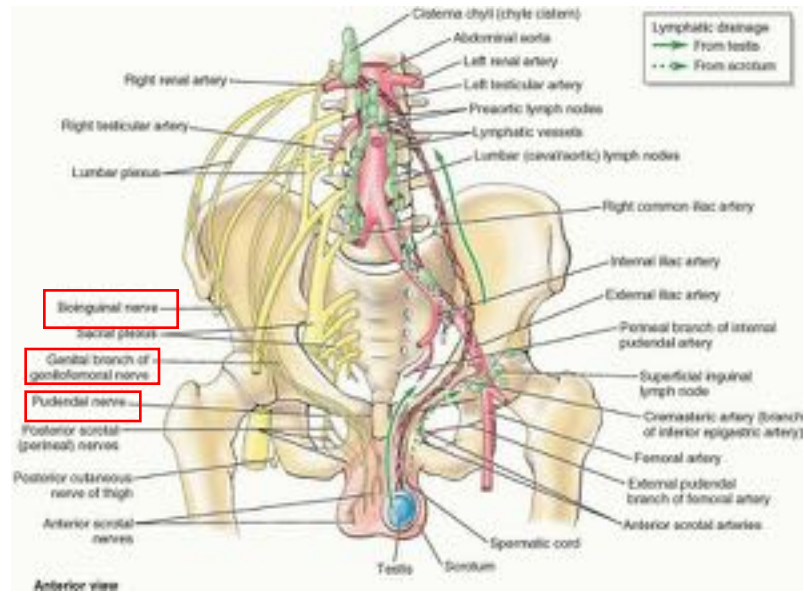
## Chronic pain: Wallerian degeneration

- Normal, stereotypic series of events occurring after injury to a nerve (traumatic, toxic, ischemic, metabolic)
- Goal: create an environment that stimulates axonal regrowth and supports regeneration of the damaged nerve
- Involves:
  - Breakdown of blood – nerve barrier
  - Proliferation of Schwann cells
  - Recruitment of circulating macrophages
  - Increased production of cytokines
  - Reorganization of the endoneurial space
- Inflammatory response in Wallerian degeneration is thought to lead to nerve hypersensitivity and chronic neuropathic pain<sup>1</sup>

Dubovy P. Ann Anat 2011

# Scrotal Anatomy

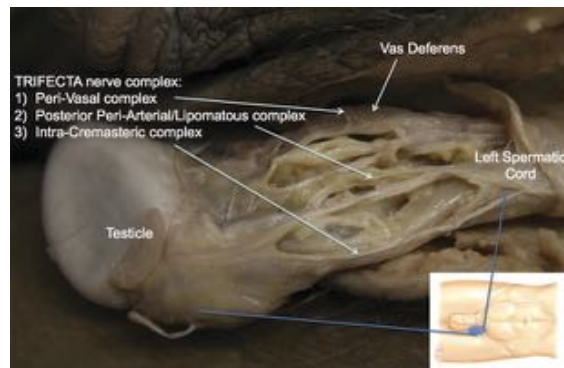
- Somatic nerves via:
  - Ilioinguinal nerve
  - Genital branch of genitofemoral nerve
  - Pudendal nerve
- Testis and epididymis via renal and aortic plexus



Moore's Clinically Oriented Anatomy 7<sup>th</sup> ed. 2013

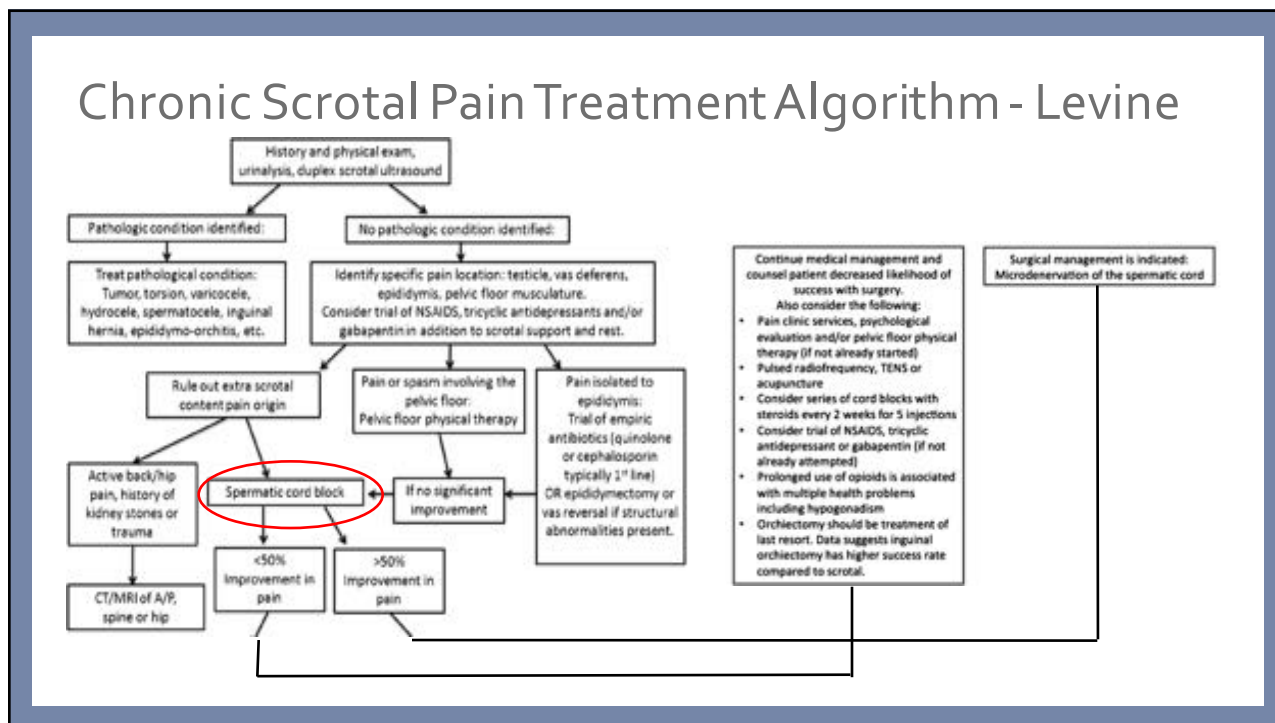
# Anatomy: Trifecta Nerve Complex

- Examined spermatic cord biopsies of 66 patients – routine specimens
  - MSCD for pain
  - Varicocelelectomy or orchiectomy (not pain related)
- Trifecta nerve complex identified
  - Confirmed using cadaveric specimens
- Increased Wallerian degeneration in pts having surgery for pain



Parekattil et al. J Urol 2013

## Chronic Scrotal Pain Treatment Algorithm - Levine



## Microsurgical Spermatic Cord Denervation

- First performed in 1978 by Devine and Schellhammer
- Can be used as a primary surgical treatment for CSP or after other surgical attempts to correct CSP
- Initial spermatic cord block with local anesthesia
  - Response to this predicts response to procedure
- Complications
  - Hydrocele, superficial wound infection, arterial injury, testicular atrophy, scrotal/incisional hematoma, seroma, low hanging testis (loss of cremasteric reflex)

For patients who are treated surgically for scrotal pain, microsurgical denervation of the spermatic cord is recommended.

A

Microsurgical denervation of the spermatic cord is an effective therapy for scrotal pain syndrome.

2b

Engeler, D et al. Eur Urol 2013

## Microsurgical Spermatic Cord Denervation

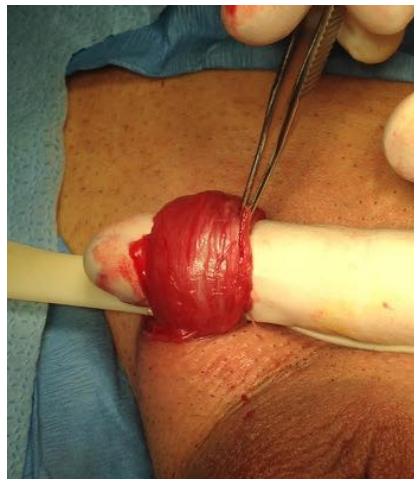


Cassidy D. CUAJ 2015



Levine L and Hoeh M. Curr Urol Rep 2015

## Microsurgical Spermatic Cord Denervation



Cassidy D. CUAJ 2015

## Microsurgical Spermatic Cord Denervation

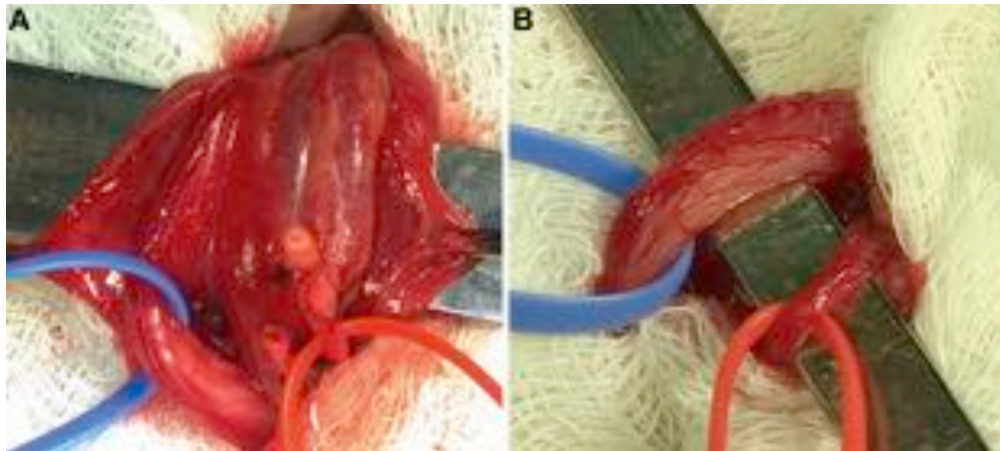


Levine L and Hoeh M. Curr Urol Rep 2015



Cassidy D. CUAJ 2015

## Microsurgical Spermatic Cord Denervation



Marconi M et al. JUrol 2015

## Microsurgical Spermatic Cord Denervation

Levine L and Matkov T. J Urol 2001

- 27 patients (32 total testicular units)
- Mean age 45
- All patients had failed conservative therapy
- Required >50% improvement with cord block to proceed
- Mean follow up 19, 24 and 10 months for each group respectively

Etiology	Complete	Partial	No response
Unknown etiology	6 (67%)	2 (22%)	1 (11%)
Previous surgery	10 (77%)	0	3 (23%)
Known etiology - no surgery	8 (80%)	1 (10%)	1 (10%)
Total	24 (76%)	3 (9%)	5 (15%)

## Microsurgical Spermatic Cord Denervation

Strom K and Levine L. J Urol 2008

- 79 patients (included 27 from previous study)
- 95 testicular units
- All patients failed conservative management
- Required >50% improvement with cord block to proceed
- Mean follow up 20 months

Response	Complete	Partial	No response
Number of pts	67 (71%)	17 (17%)	11 (12%)

## Microsurgical Spermatic Cord Denervation

Heidenreich et al. Eur Urol 2002

- 35 patients
- Mean age 46
- Follow up 34 months
- **All patients had complete, temporary resolution of pain with cord block**
- Complications: 2 scrotal hematomas
- 35/35 had complete resolution of pain initially
- 34/35 patients (96%) were pain free at last follow up
- Suggests that response to cord block predicts success of procedure<sup>1</sup>

Benson J et al. J Sex Med 2013

## Microsurgical Spermatic Cord Denervation

Cassidy D. CUAJ 2015

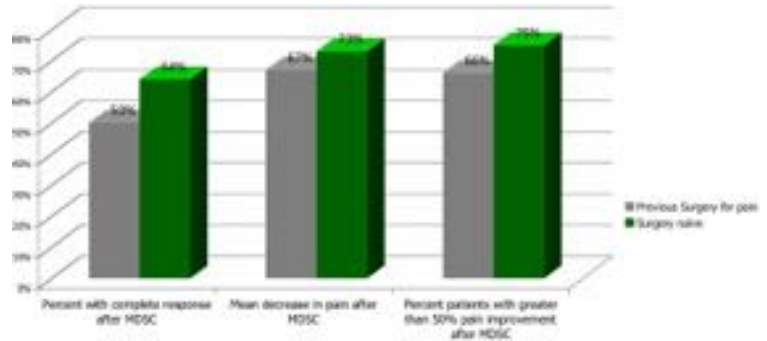
- First published experience at a Canadian center
- 9 patients
- Mean age 42
- Follow up 3-9 months
- Average VAS pain scores
  - Pre op 7.5
  - Post op 0.1
- No complications

Response	Complete	Partial
# of patients	7 (78%)	2 (22%)

# Microsurgical Spermatic Cord Denervation

Larsen et al. J Urol 2013

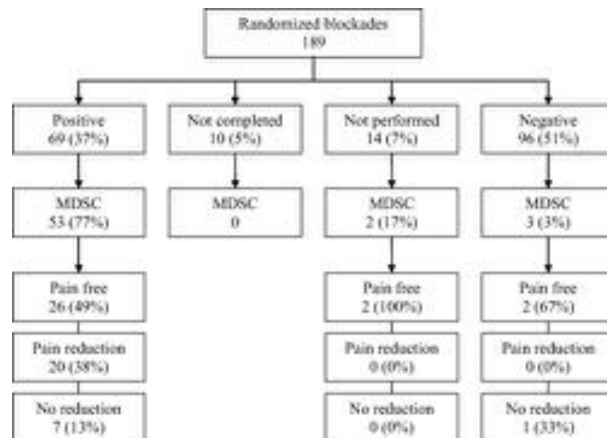
- 68 patients
  - 30 prior surgery
  - 38 no prior surgery
- Surgical procedures included
  - Varicocelectomy
  - Orchiopexy
  - Epididymectomy
  - Hernia repair
  - Vasovasostomy
  - Spermatocelectomy
  - hydrocelectomy
- Mean age 42
- Follow up 10 months



# Microsurgical Spermatic Cord Denervation

Oomen R et al. PAIN 2014

- 180 patients
- Double blind series of 3 cord blocks
  - Lidocaine
  - Bupivacaine
  - Normal Saline
- Mean follow up 42 months
- Complications
  - Hydrocele (1)
  - Hematoma (1)

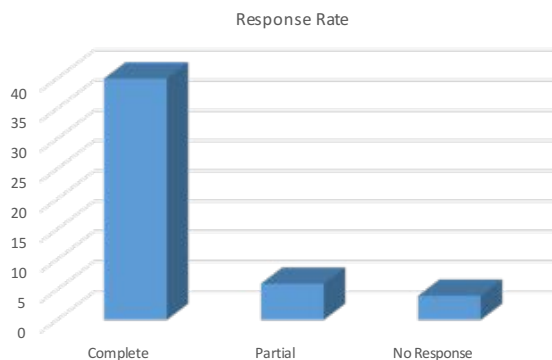




## Microsurgical Spermatic Cord Denervation

Marconi M et al. J Urol 2015

- 50 patients (52 testicular units)
- 2 cord blocks (levobupivacaine and NS)
- 70% idiopathic
- 6 month follow up
- Complications
  - Hematocele (1)
  - Hydrocele (1)



## Robotic Assisted Microsurgical Spermatic Cord Denervation

Parekattil S and Gudeloglu A. Asian J Androl 2013

- 401 procedures
- PIQ-6 rather than VAS
- Median follow up 23 months
- Utilize bio-inert wrap to prevent cord neuroma
- Complications
  - Testicular ischemia (1)
  - Hematoma (9)
  - Seroma (2)
  - Testicular artery injury<sup>1</sup> (2)
  - Vas injury<sup>1</sup> (1)

Response (6 months)	Complete	Partial	No Response
# of patients	289 (72%)	57 (14%)	55 (14%)

<sup>1</sup> repaired intraop

## Alternative Treatments and Future Research

- Botox
  - Khambati A et al. J Sex Med 2014
  - Tojuola B et al. Indian J Urol 2016
- Microcryoablation
  - Tojuola B et al. Indian J Urol 2016
- Radiofrequency denervation
  - Basal S et al. J Androl 2012
- Multiphoton imaging and laser ablation
  - Ramasamy R et al. J Urol 2012

## Conclusion

- Chronic scrotal pain is a common and challenging condition to diagnose and treat
- Conservative management is the mainstay of therapy followed by surgical treatment of identifiable causes
- Microsurgical spermatic cord denervation is a reasonable option for patients with chronic scrotal pain but further controlled studies are required
- Orchiectomy is poorly studied and utilized as a last resort in treatment
- Novel therapies are being developed and require further research

