Understanding and management of chronic scrotal content pain (CSCP)

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Definition

◆ Chronic scrotal content pain (CSCP)

- ✓ *Chronic testicular pain, Chronic scrotal pain, Chronic orchialgia, Testicular pain syndrome*
- ✓ *Pain or discomfort localized to the contents of the scrotum (testis, epididymis, spermatic cord)*
- ✓ *Present for ≥ 3 months*

- ✓ No obvious etiology is found in a significant proportion of patients, which can be frustrating for the patient and physician
- ✓ No universally accepted standardized protocols for diagnosis and treatment

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Etiology

Differential Diagnosis for Scrotal Content Pain

Etiology	Common History and Examination Findings	Adjunctive Testing	Treatment
Testicle/epididymis			
Epididymo-orchitis	• Acute onset • Pain localized to epididymis and/or testicle • Pain relieved with elevation of the testicle (positive Prehn's sign	• Scrotal duplex Doppler ultrasound (increased blood flow to the testicle and epididymis)	• Anti-inflammatories • Scrotal elevation • Antibiotics
Testicular torsion	• Acute onset • Pain out of proportion to physical exam • Absent cremasteric reflex • Anorexia	• Scrotal duplex Doppler ultrasound (absent testicular blood flow)	• Surgical exploration
Testicular tumor	• Indolent onset • Palpable scrotal mass localized to the testicle	• Scrotal duplex Doppler ultrasound • Serum tumor markers • Cross-sectional imaging of the abdomen/pelvis and chest	• Radical inguinal orchiectomy
Testicular infarct	• Acute onset • History of vascular risk factors	• Scrotal duplex Doppler ultrasound	• Anti-inflammatories • Local cares
Epididymal cyst		• Scrotal duplex Doppler ultrasound	• Observation • Epididymal cyst excision
Spermatocele		• Scrotal duplex Doppler ultrasound (fluid-filled structure emanating from epididymis)	• Observation • Spermatocelectomy
Hydrocele	• Unilateral scrotal swelling • Positive trans-scrotal illumination	• Scrotal duplex Doppler ultrasound (hypo-echoic fluid surrounding testicle)	• Observation • Hydrocelectomy

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Etiology

Differential Diagnosis for Scrotal Content Pain

- **Severe pain requiring treatment:** approximately 1% to 2%
- **Mechanism:** Increased pressure proximal to the vasectomy site → aberrant neuronal signaling in the densely populated pain fibers within perivasal tissues
- **Average time to presentation:** approximately 2 years
- **PEx:** painful and swollen epididymis, tender vasectomy site, and sperm granuloma

Etiology	Common History and Examination Findings	Adjunctive Testing	Treatment
Spermatic cord			
Paratesticular tumor			
Varicocele			
Post-vasectomy pain syndrome			
Obstructing ureteral calculus			
Inguinal hernia	• Gastrointestinal symptoms	• CT abdomen/pelvis	
Vascular aneurysm	• Vascular risk factors • Claudication	• CT abdomen/pelvis with IV contrast • MRI abdomen/pelvis • Angiography	• Open or endovascular aneurysm repair
Retroperitoneal mass	• Abdominal mass • Flank pain • Hematuria	• CT abdomen/pelvis with IV contrast • MRI abdomen/pelvis	• Surgical resection • Radiation • Chemotherapy

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Etiology

Differential Diagnosis for Scrotal Content Pain

Etiology	Common History and Examination Findings	Adjunctive Testing	Treatment
		Other	
Spinal pathology	• Chronic back pain • Lower extremity weakness or pain • Positive straight-leg raise test and other provocative maneuvers	• Radiograph of the lumbar and sacral spine • MRI spine	• Physical therapy • Neurosurgery or orthopedic surgery referral
Urinary tract infection	• Hematuria • Irritative urinary symptoms (frequency, urgency, dysuria) • Fever • Suprapubic and/or flank pain	• Urinalysis • Urine culture • Renal/bladder ultrasound • Cross-sectional imaging of the abdomen/pelvis	• Antibiotics
Chronic pelvic pain syndrome Interstitial cystitis Chronic prostatitis	• Bothersome urinary symptoms despite negative work-up for infectious etiologies • Gastrointestinal symptoms including fecal urgency or pain with bowel movements • Pelvic and suprapubic pain	• Urinalysis • Urine culture • 360 DRE to evaluate for pelvic floor tension and tenderness • Cystoscopy • Urodynamic testing	• Anti-inflammatories • Pelvic floor physical therapy • Oral therapy: amitriptyline, cimetidine, hydroxyzine, pentosane polysulfate • Intravesical therapy: heparin, DMSO, lidocaine
Pelvic floor tension myalgia	• Pelvic and suprapubic pain		• Pelvic floor physical therapy
Idiopathic	35-45%		• Anti-inflammatories • Amitriptyline • Spermatic cord block series • MDSC

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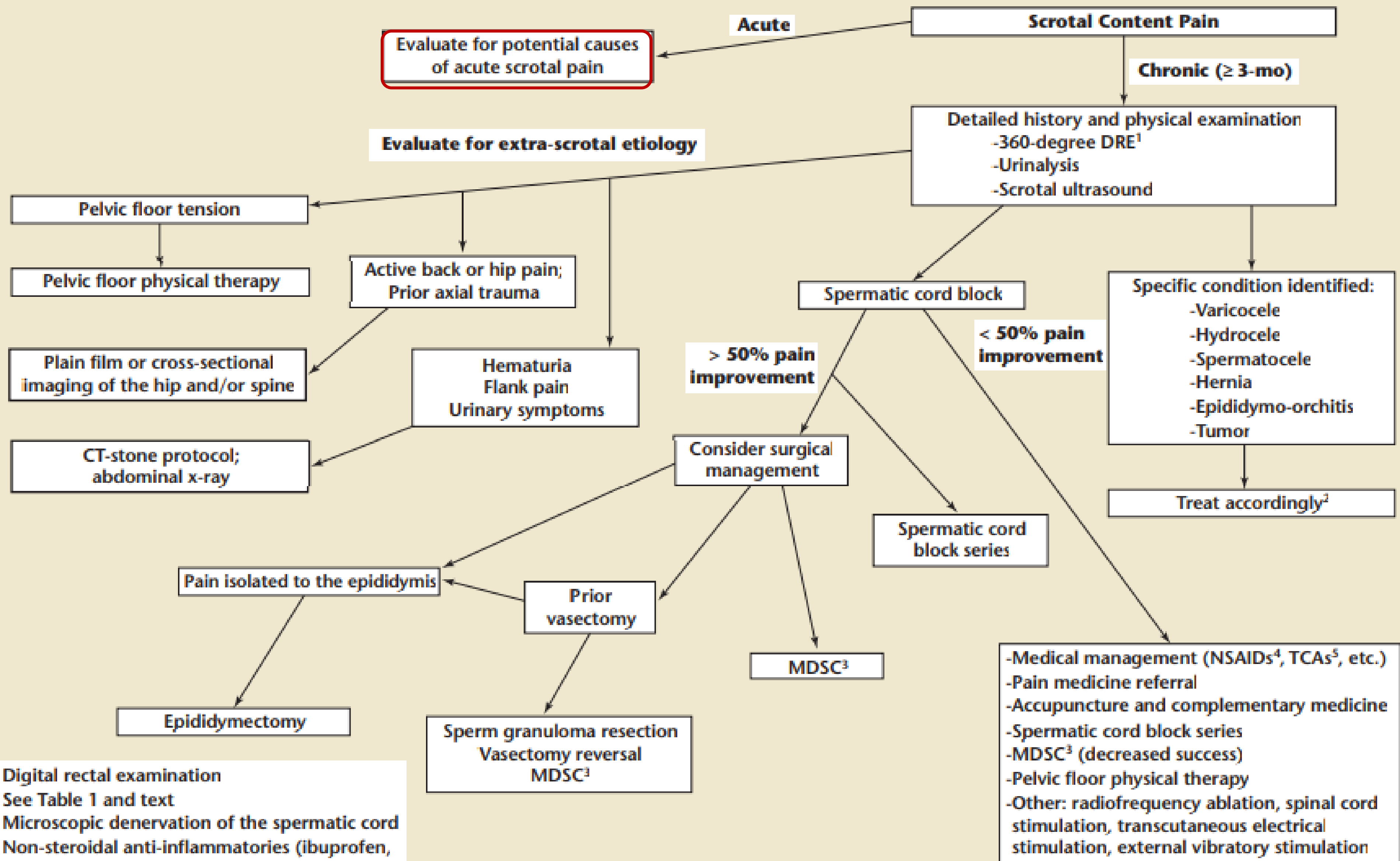
Diagnosis and Treatment Algorithm for CSCP



Diagnosis and Treatment Algorithm for CSCP

- ✓ **Crucial historical elements**
  - pain location
  - subjective description (sharp, dull, burning)
  - timing (onset, duration, constant vs intermittent)
  - radiation to surrounding structures
  - severity
- ✓ **Medical history**
  - prior STD, childhood urologic conditions, back and spine pathology, psychological conditions such as anxiety or depression, prior abdominal or pelvic surgery
- ✓ **Social history**
  - sexual abuse history

Acute

Scrotal Content Pain

Chronic (≥ 3-mo)

Detailed history and physical examination
-360-degree DRE[1]
-Urinalysis
-Scrotal ultrasound

Spermatic cord block

< 50% pain improvement

Specific condition identified:
-Varicocele
-Hydrocele
-Spermatocele
-Hernia
-Epididymo-orchitis
-Tumor

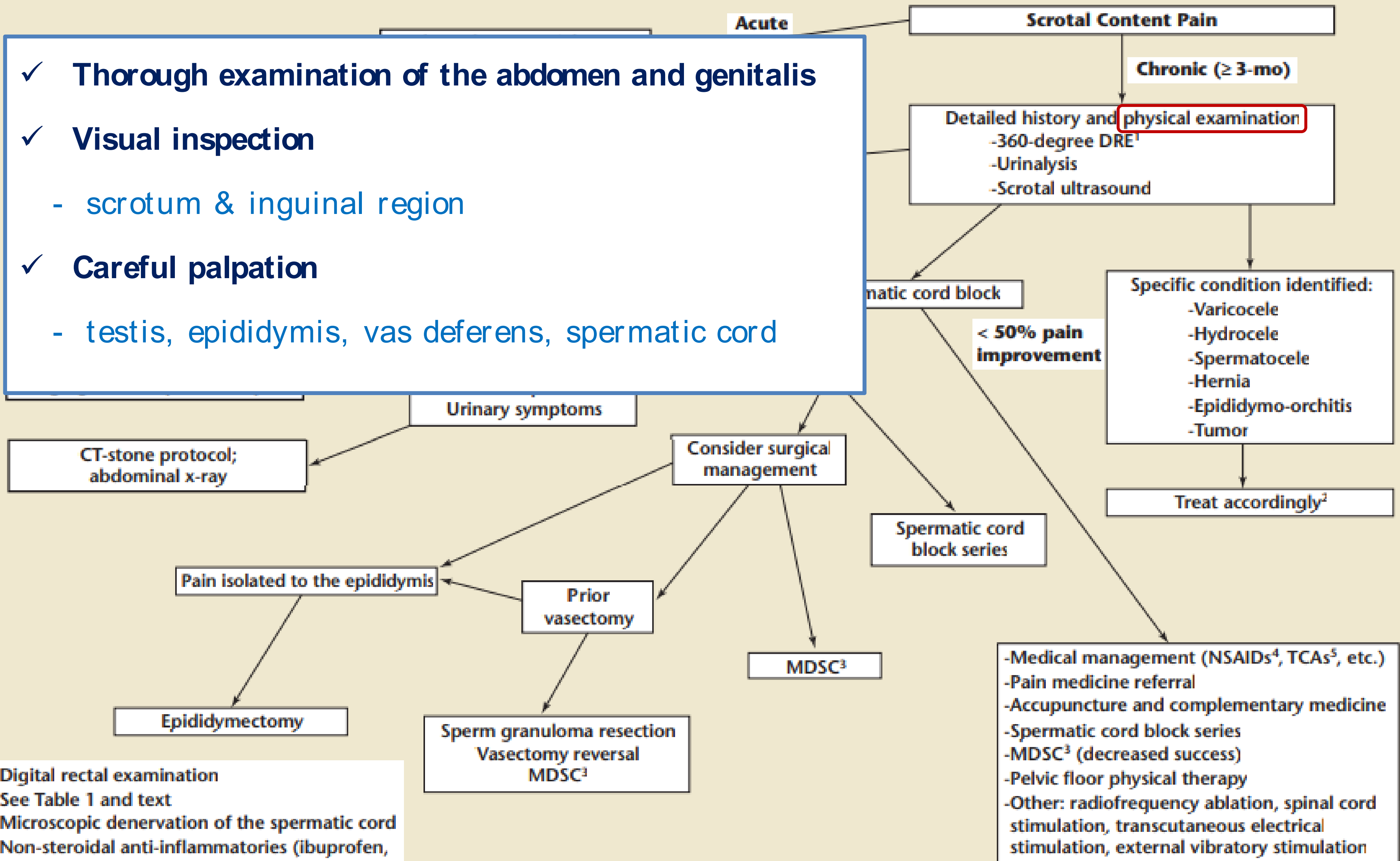
Treat accordingly[2]

Spermatic cord block series

-Medical management (NSAIDs[4], TCAs[5], etc.)
-Pain medicine referral
-Accupuncture and complementary medicine
-Spermatic cord block series
-MDSC[3] (decreased success)
-Pelvic floor physical therapy
-Other: radiofrequency ablation, spinal cord stimulation, transcutaneous electrical stimulation, external vibratory stimulation

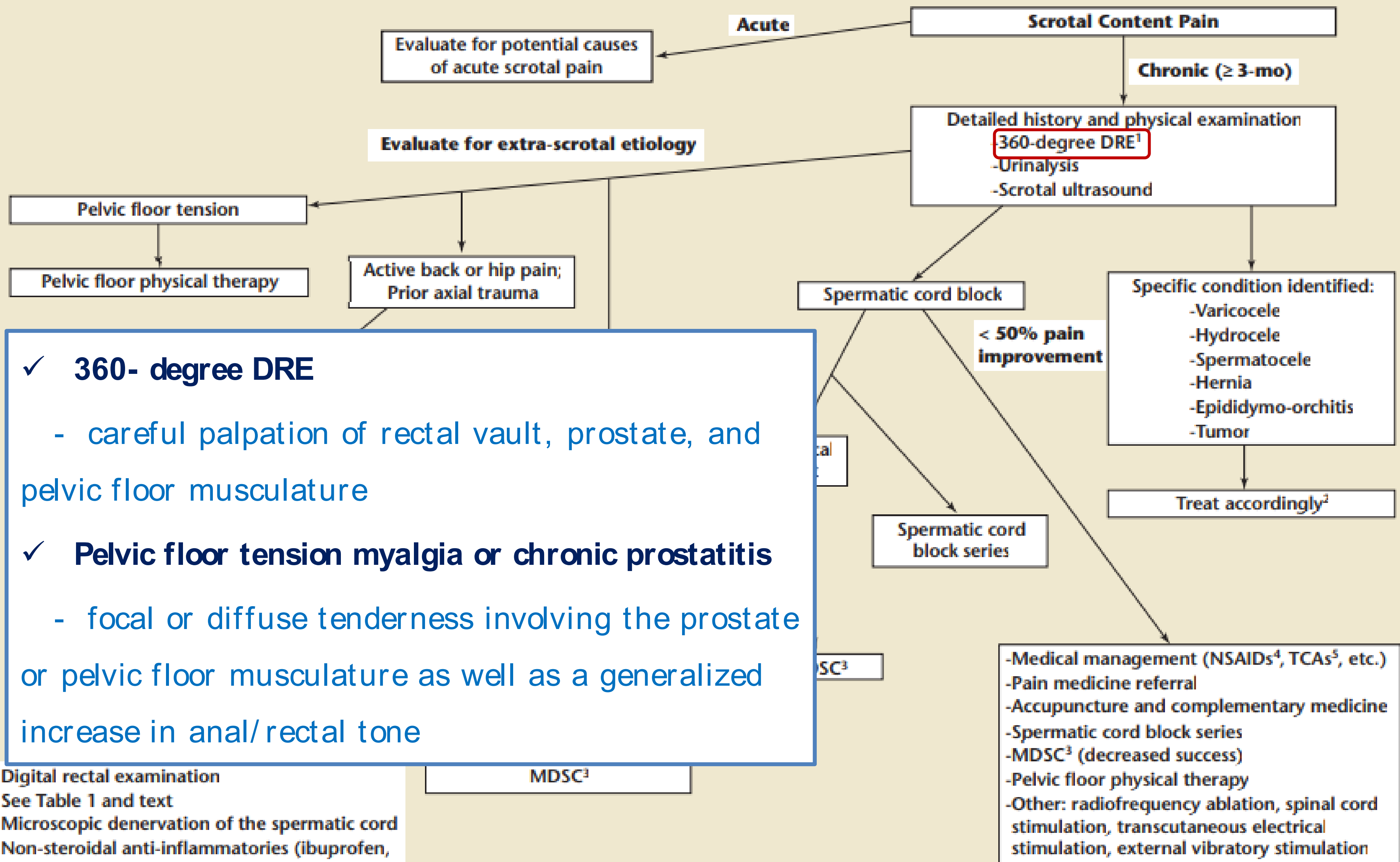
[5] Tri-cyclic anti-depressants (amitriptyline)

Diagnosis and Treatment Algorithm for CSCP



- ✓ **Thorough examination of the abdomen and genitalis**
- ✓ **Visual inspection**
  - scrotum & inguinal region
- ✓ **Careful palpation**
  - testis, epididymis, vas deferens, spermatic cord

Diagnosis and Treatment Algorithm for CSCP



- ✓ **360- degree DRE**
  - careful palpation of rectal vault, prostate, and pelvic floor musculature
- ✓ **Pelvic floor tension myalgia or chronic prostatitis**
  - focal or diffuse tenderness involving the prostate or pelvic floor musculature as well as a generalized increase in anal/rectal tone

Diagnosis and Treatment Algorithm for CSCP

Scrotal Content Pain

Acute → Evaluate for potential causes of acute scrotal pain

Chronic (≥ 3-mo) → Detailed history and physical examination
-360-degree DRE[1]
-Urinalysis
-Scrotal ultrasound

Specific condition identified:
-Varicocele
-Hydrocele
-Spermatocele
-Hernia
-Epididymo-orchitis
-Tumor

Treat accordingly[2]

...tic cord block

< 50% pain improvement

Spermatic cord block series

Prior vasectomy

MDSC[3]

Epididymectomy

Sperm granuloma resection
Vasectomy reversal
MDSC[3]

-Medical management (NSAIDs[4], TCAs[5], etc.)
-Pain medicine referral
-Accupuncture and complementary medicine
-Spermatic cord block series
-MDSC[3] (decreased success)
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✓ **Urinalysis and microscopy**

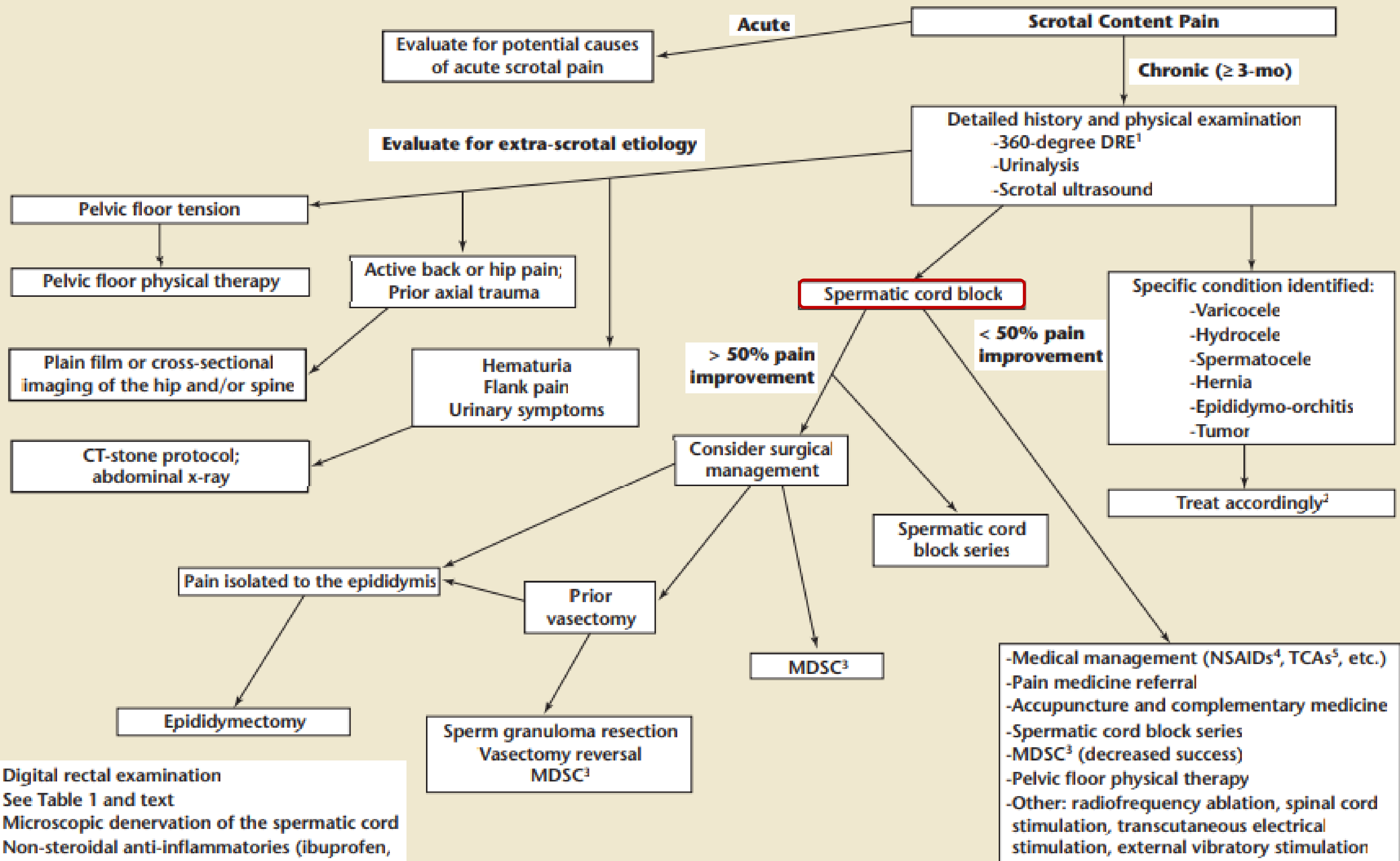
- hematuria or pyuria
- infectious etiology or referred pain from stone

✓ **Scrotal USG**

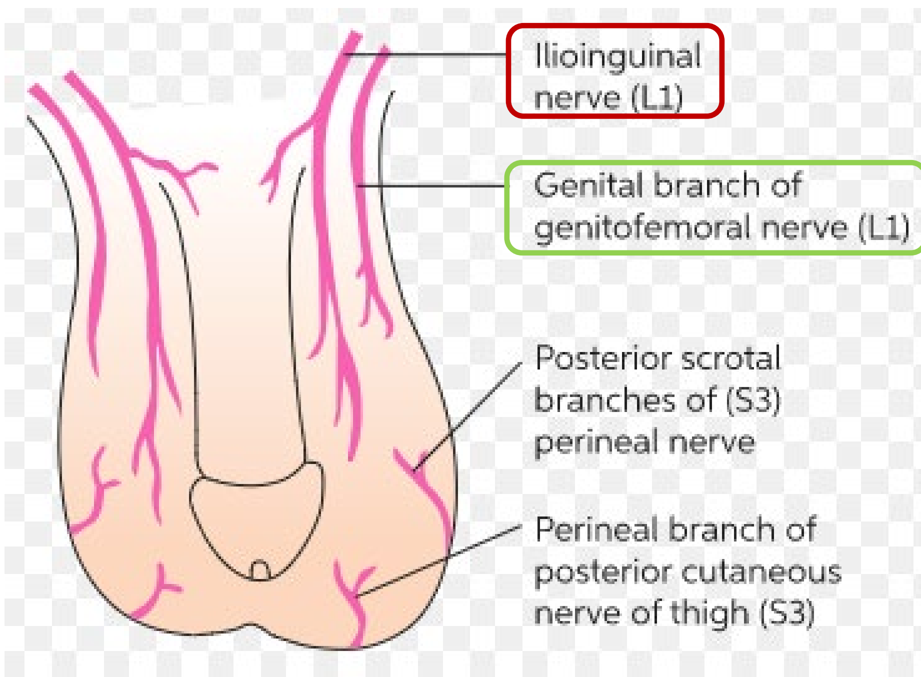
- structural causes within the scrotum such as tumor, cyst, or varicocele
- be recommended in most circumstances

[1] Digital rectal examination
[2] See Table 1 and text
[3] Microscopic denervation of the spermatic cord
[4] Non-steroidal anti-inflammatories (ibuprofen, meloxicam)
[5] Tri-cyclic anti-depressants (amitriptyline)

Diagnosis and Treatment Algorithm for CSCP



Neuroanatomy of Spermatic Cord



- Ilioinguinal nerver (L1 root)
  - ✓ Sensory fibers : base of the penis, superior scrotum, and medial thigh
- Genital branch of genitofemoral nerve (L1- 2)
  - ✓ Sensory fibers : anterolateral scrotum
  - ✓ Motor fibers : cremasteric reflex

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- ✓ Superior, middle, and inferior spermatic nerves are felt to play dominant role in pain transmission with CSCP
- ✓ Nearly 50% of nerve fibers lie in close proximity to the vas deferens
- ✓ Another 20% of nerve fibers located within the spermatic fascia

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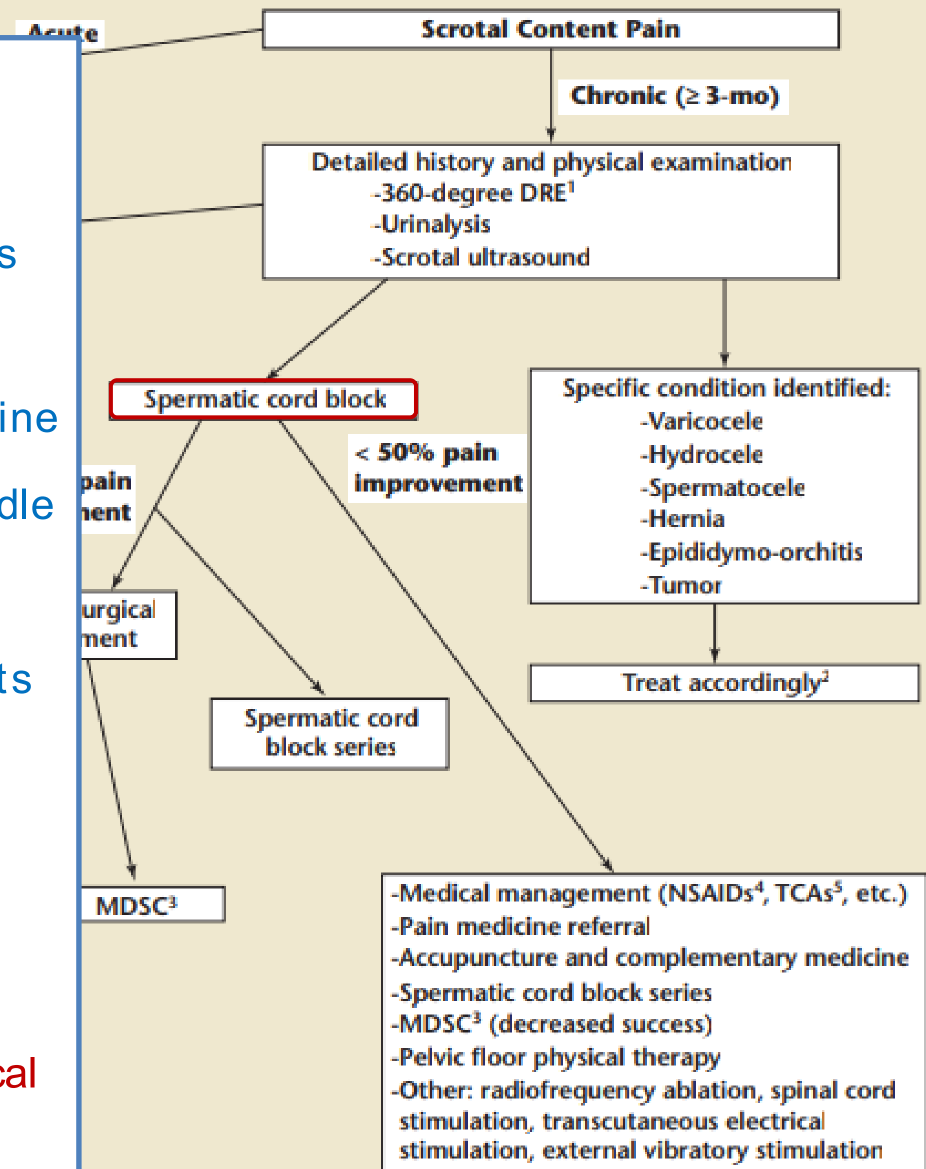
Diagnosis and Treatment Algorithm for CSCP

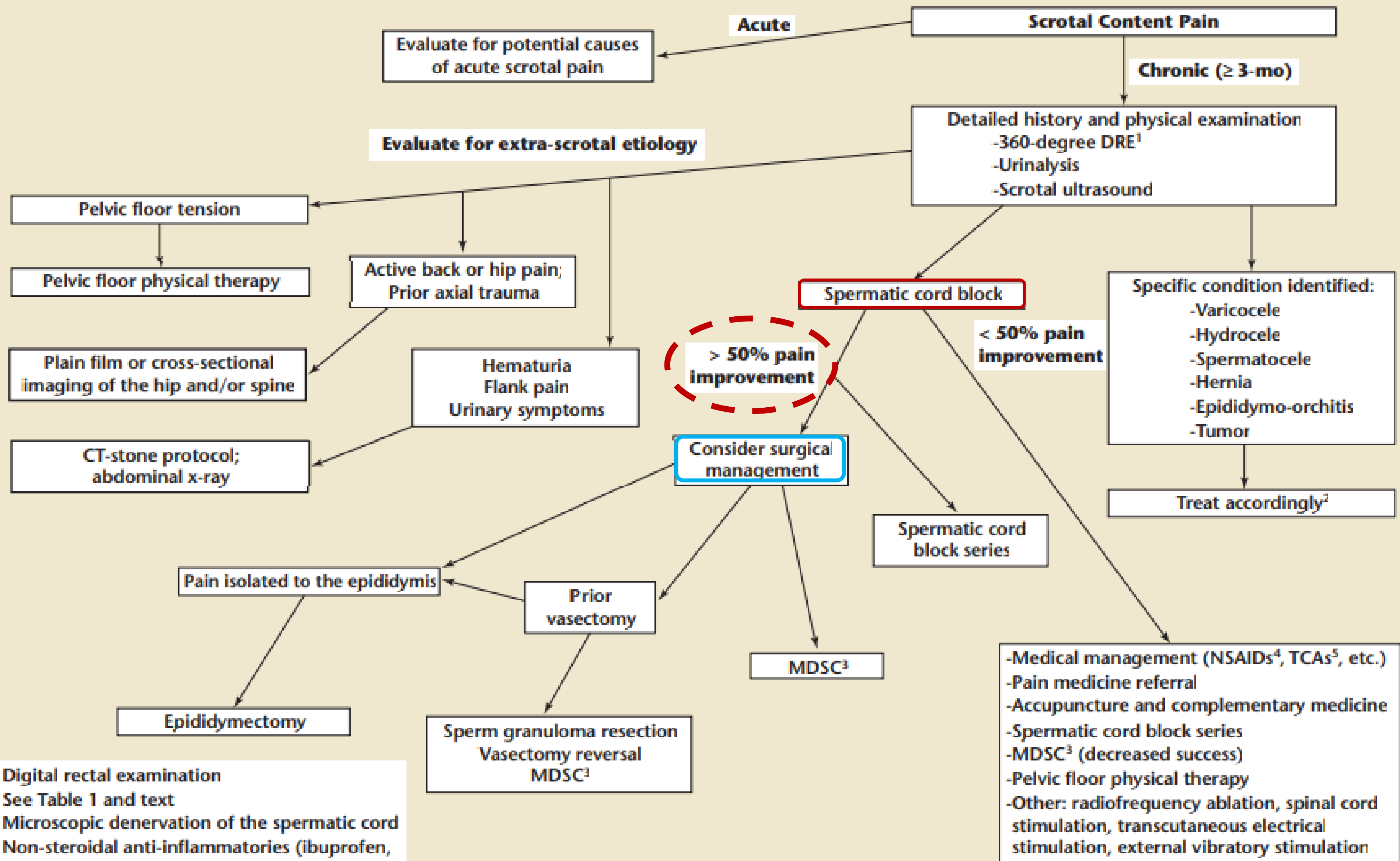
✓ **Indication**

- any patient presenting CSCP who desires definitive management in the absence of an obvious source of referred pain
- 20 mL of 0.25% bupivacaine without epinephrine
- instillation into the cord with a 27- gauge needle

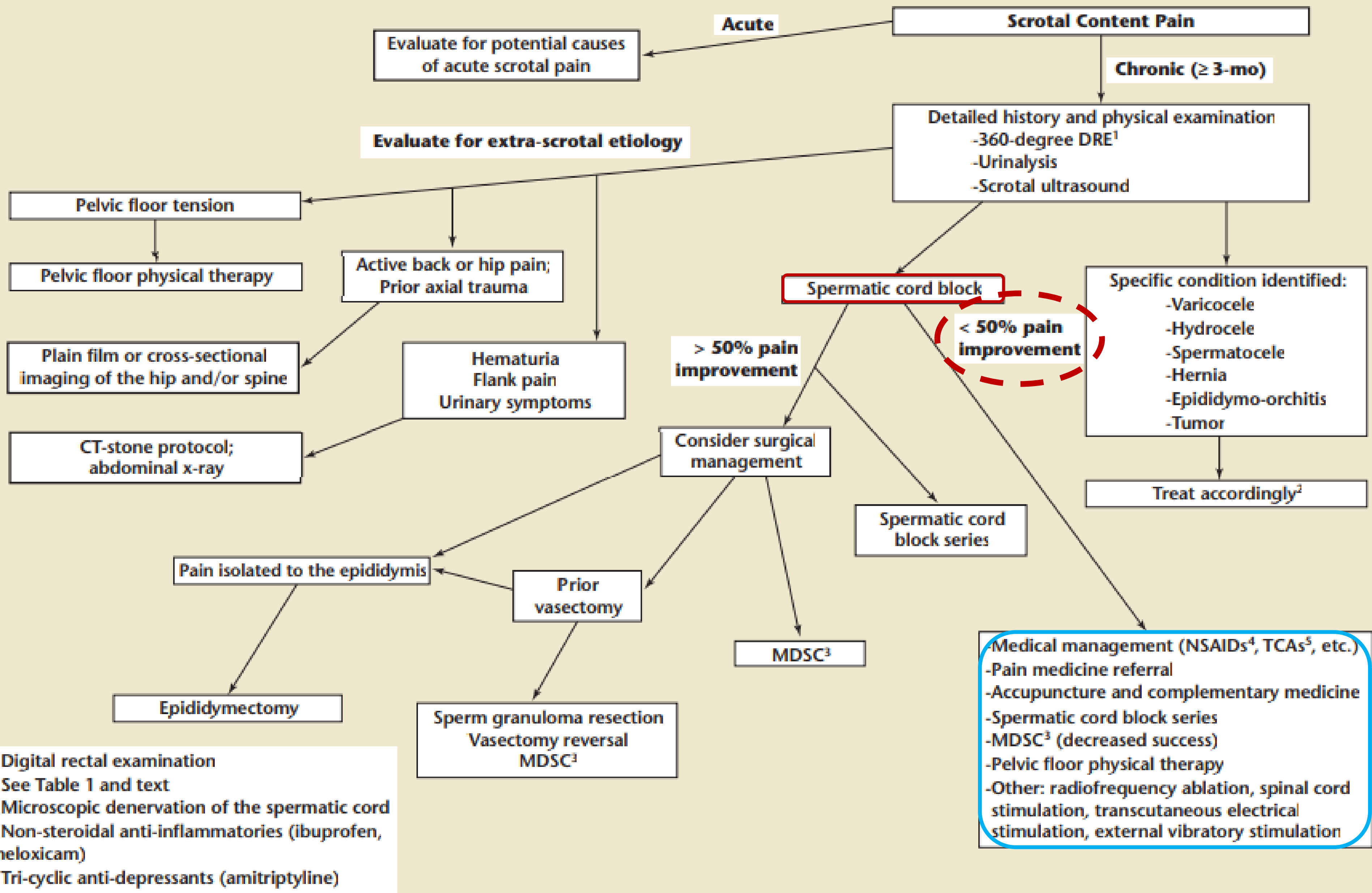
- Pain improvement after the cord block suggests that afferent input from the genitofemoral, ilioinguinal, and spermatic nerves are at least partially responsible for pain transmission
- Patients with pain improvement lasting more than 4 hours are more likely to benefit from surgical management



Diagnosis and Treatment Algorithm for CSCP



Diagnosis and Treatment Algorithm for CSCP



CSCP Treatment: *Nonsurgical Options*

◆ CSCP Treatment

✓ *Lack of evidence- based guidance*

◆ Conservative management

✓ Rule out an underlying structural cause, a source of referred pain, or urogenital infections

◆ NSAIDs

✓ Improve pain and inflammation

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CSCP Treatment: *Nonsurgical Options*

✓ *A neuropathic component plays a role in ≥ 30% of CSCP patients.*

◆ Gabapentin

Sinclair AM, et al. Int J Urol 2007;14:622

✓ >60% of patients receiving gabapentin (300- 1800 mg daily)

→ ≥ 50% improvement in scrotal pain

◆ Low- dose amitriptyline (TCA)

✓ Beginning with amitriptyline, 10mg, bedtime → increase to 20mg nightly if tolerated

✓ 67% of patients taking nortriptyline (another TCA)

→ ≥ 50% improvement in scrotal pain

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CSCP Treatment: *Nonsurgical Options*

- **Spermatic cord block**
  - ✓ Break the cycle of aberrant afferent peripheral pain signaling
  - ✓ A series of spermatic cord injections with 9 mL of 0.5% bupivacaine mixed with 10 mg/ 1 mL triamcinolone administrated once every 2 weeks for a series of 4 to 5 injections
  - ✓ Most efficacious in patients with adequate response to a diagnostic spermatic cord block and pain duration < 6 months

- Pulsed radiofrequency ablation of the genitofemoral and ilioinguinal nerves
- TENS (Transcutaneous electrical stimulation)
- Acupuncture, Vibratory stimultion

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CSCP Treatment: *Surgical Options*

◆ The key to successful surgical outcomes:

- ✓ ***Patient Selection!!!***
- ✓ *Positive response to the block, defined as at least a 50% reduction in scrotal content pain, surgical treatment may be offered.*

Siu W, et al. Urology 2007;70:333
Hori S, et al. J Urol 2009;182:1407

◆ Epididymectomy

- ✓ If the pain isolated to the epididymis, epididymectomy may improve or resolve pain in as many as 75% to 90%.

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CSCP Treatment: *Surgical Options*

◆ Microscopic denervation of the spermatic cord (MDSD)

Tan WP et al. Sex Med Rev 2018; 6: 328
Calixte N et al. J Urol 2018; 199: 1015

✓ Overall, compete pain resolution following MDSD ranges from 50% to 100%, with partial response in 3% to 24%.

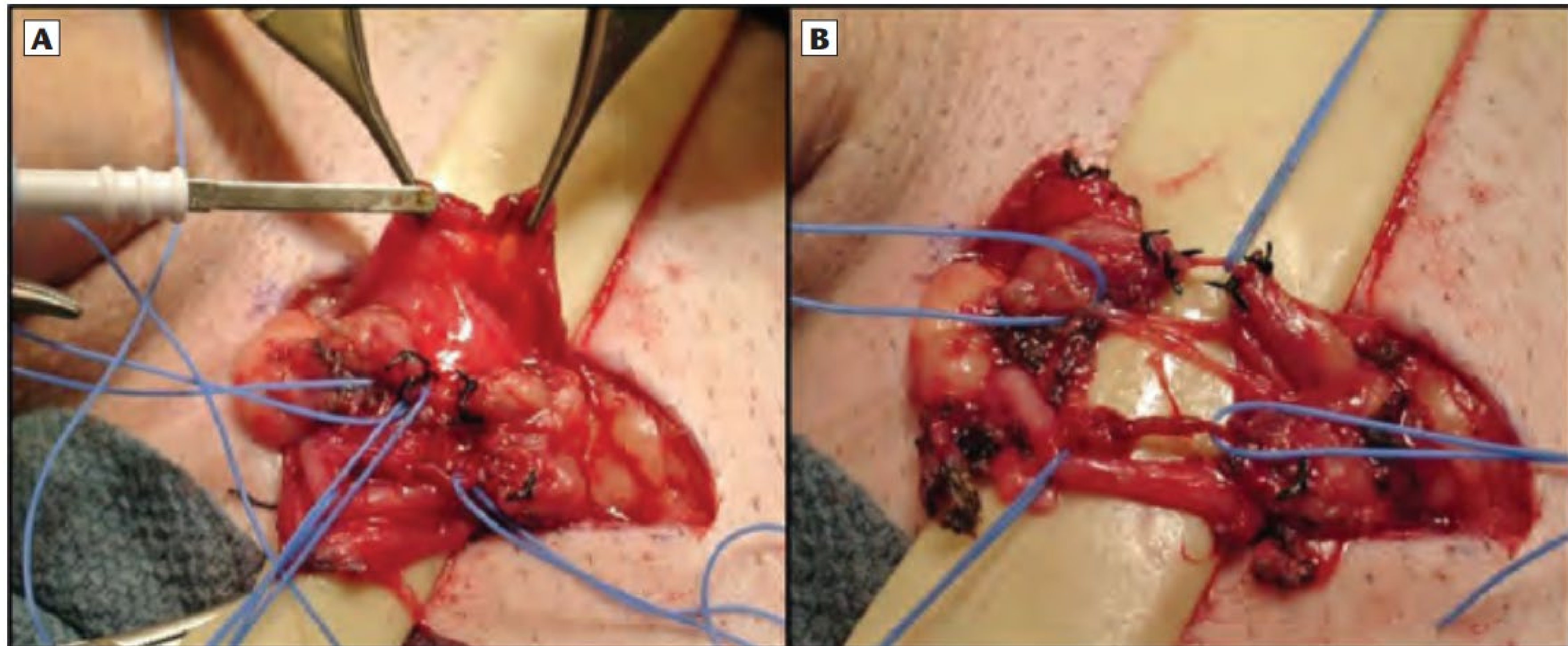

Figure 2. Microscopic denervation of the spermatic cord. (A) Ligation of the cremasteric fascia after isolation and sparing of the vas deferens, spermatic cord arteries, and several small lymphatic challens, and (B) the final appearance of the spermatic cord.

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Take Home Message!

MAIN POINTS

- Chronic scrotal content pain (CSCP), also referred to as chronic testicular pain, chronic scrotal pain, chronic orchialgia, testalgia, and testicular pain syndrome, is characterized by pain or discomfort localized to the contents of the scrotum including the testicle, epididymis, and spermatic cord. To meet diagnostic criteria, the pain must be present for more than 3 months and interfere with activities of daily living.
- The underlying etiology for CSCP varies, and an obvious etiology is not readily identified (idiopathic) in 35% to 45% of patients presenting with CSCP.
- The evaluation and management of CSCP includes historical elements include the pain location, subjective description (sharp, dull, burning), timing (onset, duration, constant versus intermittent), radiation to surrounding structures, and severity. A thorough examination of the abdomen and genitalia is mandatory.
- Conservative management is appropriate after ruling out an underlying structural cause (ie, scrotal mass, varicocele, or inguinal hernia) or a source of referred pain (ie, ureteral calculus, hip or labrum disease, or spinal pathology).
- Surgical management can offer patients significant and lasting pain improvement. The key to successful surgical outcomes lies in patient selection. In the presence of a structural abnormality, definitive treatment of the underlying process can significantly improve scrotal pain.

Thank you

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