

DIAGNOSTIC AND TREATMENT ALGORITHM FOR CHRONIC POST-HERNIA REPAIR PAIN, ULTRASOUND-GUIDED CRYONEUROABLATION OF ILIOHYPOGASTRIC, ILIOINGUINAL AND GENITOFEMORAL NERVES



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Objectives: Describe a diagnostic and treatment algorithm, including ultrasound-guided (US) cryoneuroablation, for chronic post-operative inguinal pain patients with iliohypogastric nerve (IHN) and/or ilioinguinal nerve (ILN) and/or genitofemoral nerve (GFN) neuralgia.

Background: Inguinal pain due to entrapment of the IHN, ILN and GFN is a common complication of lower abdominal surgery, estimated to be between 15 and 35% (1,2). If no obvious recurrence of the hernia is identified, pain treatment follows. It is ideally multimodal, conservative at start and includes physical therapy, massage, NSAIDs and adjuvant medications. If patient fails conservative treatment, then directed for minimally invasive methods. (IMAGE 1). The innervation areas of the affected nerves often overlap and shows a large anatomic variation (3,4); therefore, precise diagnostic injection of the individual nerves is mandatory.

Methods: Thorough history and physical exam directs suspicion of nerve involvement (IHN, ILN, or GFN), which is then confirmed by low volume (1ml) US guided local anesthetic injection. Injection is considered successful if patient is numb in the distribution of the nerve. Patient is then asked to engage in activities that would normally provoke pain. If pain persists, the next most likely involved nerve is injected in the same fashion. If good (min 80%), but temporary relief is achieved, patient is scheduled for cryoneuroablation. It is performed using in-plane approach. IHN and ILN are easily targeted just medial to the ASIS (IMAGE 2), while the genital branch of the GFN can be found at the lateral aspect of the spermatic cord (IMAGE 3). Patients with equivocal response for the diagnostic injection are not considered candidates for neuroablative techniques and re-evaluated by surgery for recurrence of the hernia.

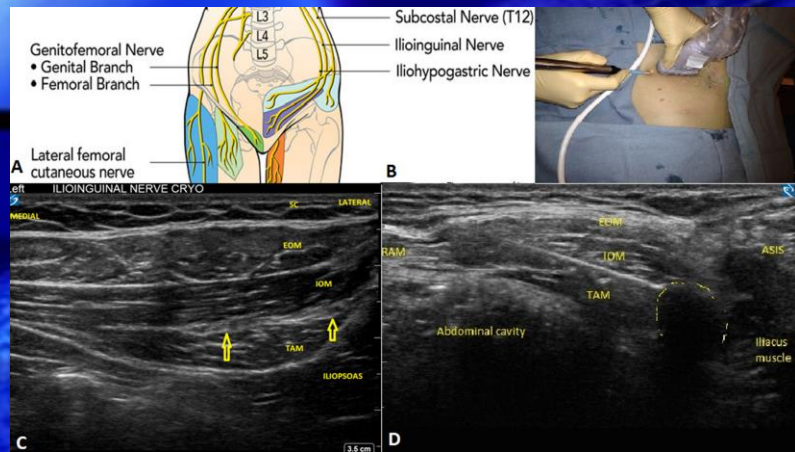


IMAGE 2: Cryoablation of the iliohypogastric and ilioinguinal nerves
 A: Innervation patterns of the groin area
 B: Cryoablation of the IHN and ILN nerves
 C: Normal sonoanatomy of the groin area, Narrow arrow pointing at IHN, wider arrow pointing at ILN nerves
 D: Same anatomy area as on image „C”, cryoprobe and ice formation at the tip of the probe at IHN

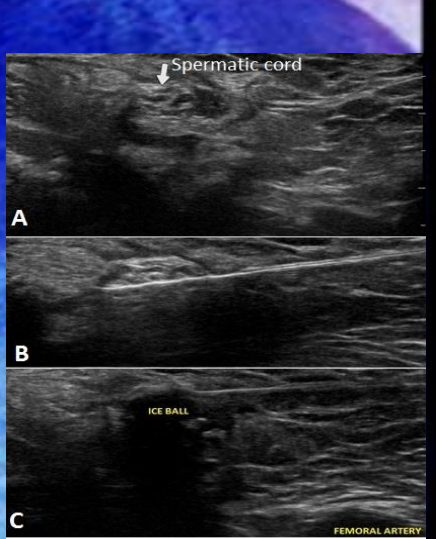


IMAGE 3: Cryoablation of the genital branch of the genitofemoral nerve
 A: US image of the spermatic cord, just above the symphysis
 B: Cryoprobe placed in the spermatic cord, ablate genitofemoral nerve
 C: Ice ball formation at the tip of the cryoprobe.

Results: At UW, we performed 36 ILN/IHN/GFN cryoneuroablations with this technique. These patients have very limited treatment options, and cryoneuroablation often allows them to return to normal function.

Conclusions: Diagnostic injections allow identification of individual nerves causing inguinal pain, and cryoneuroablation can offer long lasting benefit.

References:
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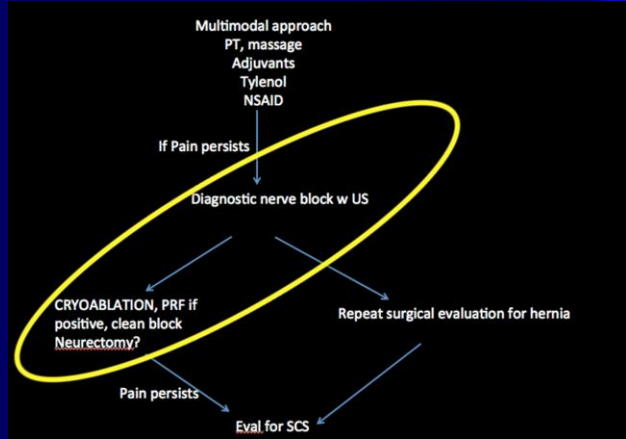


IMAGE 1: Treatment algorithm for patients with chronic groin pain