This article builds upon the information that was presented in a previous issue of Rounds (Fall 2006, vol. 2, issue 3) by specifically addressing treatment modalities encompassing the full spectrum of interventions, from trigger point injections to surgery. Just over the course of 2 years, progress has been made on two fronts: (1) Refinements on traditional injections and other techniques and, (2) Emergence of novel methods and surgical interventions for treating specific pelvic pain syndromes.

Pelvic myofascial pain may be primary or a consequence of effects on neural or connective tissue changes arising from trauma or injury, and at times, surgery. On occasion, these myofascial pain generators arise idiopathically. The pelvic floor musculature is a frequent source of pelvic pain and examination can identify points that reproduce the symptoms of pain. The points serve as triggers for the pain and are usually palpable as band-like or nodule-like prominences in the muscle belly. These findings are diagnostic for myofacial pelvic pain syndromes and imply the presence of muscle spasm or dystonia in the pelvis.

Trigger point injections can help reverse the cycle of spasm and are best administered within the context of a comprehensive pelvic floor physiotherapy program. Classically, trigger points are injected with local anesthetic and a small amount of corticosteroid, particularly if an inflammatory component is suspected. However, studies have demonstrated that the nature of the injectate makes little difference in outcome. Moreover, it has been shown that even dry-needling will have a similar therapeutic response. Trigger point injection therapy is not without risk. Experience and careful technique are mandatory to lessen the chance of viscus perforation, nerve damage or infection.

In circumstances where the clinician encounters pelvic spasm and dystonic pelvic floor muscle that is refractory to non-invasive treatments, injection with botulinum toxin may provide a significant source of pain control by eliciting a profound state of muscle relaxation within the pathologic myofascial tissue. The toxin, of which there are 7 subtypes, prevents release of acetylcholine at the neuromuscular junction, and the muscle is unable to contract. Types A and B are commercially available in this country and the dosages, measured in units are distinct and non-interchangeable for each type of toxin. Muscle relaxation can occur immediately or may be delayed for a few days, but the duration of effect can last many months. Adverse side effects have occurred when excessive doses have been used or non-approved toxin has been administered.

Peripheral neuralgias account for a significant proportion of pelvic pain conditions. Ilioinguinal and genitofemoral neuralgias are two common examples that are amenable to neural blockade. In this instance, the pain is typically in the lower quadrant and radiates distally, at times encompassing the proximal thigh. Blockade with a combination of a long-acting local anesthetic and a corticosteroid serves both diagnostic and therapeutic purposes. Duration of effect is usually temporary, but can be long term. Other ablative methods (for example, radiofrequency denervation, cryo-ablation or injection of neurolytic agents) are available for those cases where pain relief is transient.

Flouroscopically-guided interventions are helpful when there is a need to address pelvic pain conditions where visceral and/or neuraxial targets are suspected. The superior hypogastric plexus mediates pain signals arising from pelvic viscera and can be blocked with image-guided techniques. As before, relief can be temporary but ablative methods are available to effect permanent changes. A caudad extension of this approach targets the ganglion impar (also known as the ganglion of Walther), which can be involved in low pelvic floor pain syndromes, encompassing genital, perineal or even rectal anatomy. The sacral epidural space is a neuraxial target that is commonly blocked when central sources of pain are suspect in chronic pelvic pain. Chronic, central inflammatory states that may arise after trauma, surgery or malignancy respond well to the deposition of corticosteroid within the sacral epidural space and/or around select sacral nerve roots.

Pudendal neuralgia is a debilitating chronic pelvic pain
condition that can arise in the absence of a specific cause or inciting event. The location of the pudendal nerve between the sacro-tuberous and sacro-spinous ligaments can predispose it to be entrapped, inflamed or damaged. The ensuing pain syndrome is classically burning, shooting, stabbing pain in the genitals, perineum and/or rectum. It is typically worse when sitting and this feature is pathognomonic. The pudendal nerve can be blocked utilizing image-guided techniques. When fibrosis is suspected, injectate containing local anesthetic, corticosteroid and hyaluronidase can be of benefit. Outcomes are clearly better when the condition is diagnosed early and treatment is comprehensive, including pelvic floor physical therapy accompanied by a series of image-targeted injections.

The treatment of chronic pelvic pain utilizing radio-frequency ablation of pain targets is a relatively new tool in the pain practitioner’s armamentarium. It is a way of delivering a thermocoagulating energy to painful neural tissue in a very controlled and targeted manner. The technology for delivering this treatment has improved dramatically. Peripheral neuralgias and more central sources of pain have been successfully treated with this technique. Relief of pain is usually long-term and in some cases, permanent. There is typically a delay of several days to several weeks after treatment before amelioration is perceived. Although side effects are rare, most concerning is damage to nerves that are not involved in pain transmission, resulting in potential sensory or motor deficits. A recent development in the use of radiofrequency ablation is in the treatment of pain arising from the sacroiliac joint.

Although not commonly categorized within the spectrum of chronic pelvic pain conditions, sacroiliitis falls within this realm, at least as a musculoskeletal condition. This pain is, in fact, not infrequently, a direct consequence of altered biomechanics resulting in undue stresses on the sacroiliac joint capsule. Diagnostic and therapeutic blocks can be performed under fluoroscopy. These are commonly transient in effect and the application of radiofrequency ablation to the entire joint-nerve-ligament complex is now possible with a recently developed tri-segmental probe that covers the full length of the joint. Previously, needle-like probes were utilized, requiring multiple lesions. This new technology allows a more complete treatment of the entire joint and the preliminary results are very favorable.

There are instances in which chronic pelvic pain conditions may not respond to treatments outlined above. In these instances, consideration for implantable technologies is in order. These implants are of two types: (1) Pumps for intrathecal delivery of analgesics and, (2) Pulse generators or spinal cord stimulators, for interruption of central pain transmission via electrodes placed within the epidural space. Implantable pumps will administer opioid and/or other analgesics directly into the cerebrospinal fluid, effecting analgesia at the level of the CNS. Some of the pumps are programmable, others deliver medication at fixed rates. Ziconotide, an N-type calcium channel blocker, is a peptide derived from the cone snail, *Conus magus* and has recently been approved for use in these implantable pumps. Preliminary experience is promising, particularly in chronic neuropathic pain states. Its use is contraindicated in severe psychiatric illness including bipolar disorder, schizophrenia, psychosis and depression.

Spinal cord stimulation is an implantable modality that can be used successfully for chronic pelvic pain. New developments in lead technology allow for effective coverage of pain transmission at various levels of the neuraxis. Successful management of chronic pelvic pain of various etiologies (ilioinguinal neuralgias, pudendal neuralgias, interstitial cystitis) has been achieved by placement of lead electrodes at the level of the sacral or low thoracic epidural space or adjacent to specific sacral nerve roots. Both pumps and stimulators require a preliminary trial to determine their effectiveness prior to implantation.

The Laparoscopic Implantation of Neuroprosthesis (LION) procedure is a new surgical approach that places the lead electrodes directly over nerve targets using the laparoscope. Initial results to treat ilioinguinal and pudendal neuralgias, sciatica and pelvic pain have been successful.

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