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Treatment of Synovial Cyst Stenosis With Radiofrequency Lesioning of the Posterior Facet Capsule – A Case Report of Two Patients

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Background: Zygapophyseal joint synovial cyst spinal stenosis can cause radicular pain issues that often require repetitive cystic rupture procedures or decompressive surgery for resolution.

Case Report: We present 2 cases of lumbar spinal stenosis with radicular findings due to lumbar zygapophyseal synovial cyst impingement that were not improved with physical therapy, epidural steroid injections, synovial cyst injections, or transforaminal injections. Synovial cysts were 1 cm and 0.7 cm preprocedure, respectively, for these 2 patients. Both cases were treated with radiofrequency (RF) lesioning of the posterior facet capsule at 3 locations from medial to lateral along the facet joint line posteriorly at the affected spinal level with complete resolution of the radicular symptoms in both cases. Follow-up was 6 months and 10 years for the 2 patients.

Conclusions: RF lesioning of the synovial capsule may be an effective treatment for synovial cyst stenosis in lieu of conventional surgery or repetitive cyst rupture techniques.

Key words: Synovial cyst, stenosis, radiofrequency, zygapophyseal joint

BACKGROUND

This is potentially a novel nonsurgical solution for synovial cyst spinal stenosis. The synovial capsule of the lumbar facet joints is the structure that allows fluid to bathe the joint. During the aging process, arthrosis can result in cystic formations in the joint. These cystic formations can result in narrowing of the lateral recess or the foraminal canal if the cyst is directed medially or anteriorly. These synovial cysts can result in spondylolisthesis in up to 40% of patients with further narrowing of the central and foraminal canals due to instability. Due to this being a degenerative process, most individuals are older and more often men than women with a 2:1 ratio (1). Due to the lumbar lordosis, most lumbar synovial cysts are found at the lower lumbar levels from L3 to S1 with L4-L5 being the most commonly affected level. Symptoms can be just low back pain from the inflamed joints or can involve radicular symptoms when the synovial cyst causes neural compression. Generally, the treatment initially involves physical therapy, epidural steroid injections, cyst aspiration, or cyst rupture. Results from these conservative therapies are generally poor with 90% of patients requiring more invasive modalities, except for synovial cyst rupture which has a 70% initial success rate, but upward of 40% of those patients required repetitive rupture procedures and 31% eventually required conventional surgery (2,3). Surgical techniques involve decompression, such as laminectomy or foraminotomy, alone or, in some cases, combined with a fusion (4). Patients who undergo a decompressive-type surgery without fusion have the

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risk of worsening of their spondylolisthesis if present or development of a new spondylolisthesis if one was not present prior to surgery (4). Results for decompressive surgery of all types is around 70%, while fusion offers an 80% success rate. For those undergoing a laminectomy- or foraminotomy-type surgery, a review study (5,6) reveals that 21.6% of patients developed recurrent back pain, 11.8% recurrent leg pain, and 3% recurrent synovial cysts. Thus, surgery is associated with good results that appear to be approximately 75% successful. We present 2 cases of patients who were treated with radiofrequency (RF) lesioning of the posterior lumbar facet capsule for their radicular symptoms associated with a synovial cyst in lieu of surgery or synovial cyst rupture procedures.

CASE 1 PRESENTATION

A 62-year-old man presented with chronic right leg pain for approximately one year prior to his initial consultation in 2012. The pain was described as a burning to achy in character in the low back that radiated to the right anterior thigh. A magnetic resonance imaging (MRI) revealed that the patient had a small disc herniation along with a synovial cyst on the right at the L4-L5 level. The radiologic report stated that the synovial cyst was approximately 1 cm in size and was definitely impinging the exiting nerve root with severe foraminal stenosis. Given the symptoms, the patient underwent a lumbar epidural steroid injection, facet capsule injections, as well as transforaminal epidural injections with relief for less than one month. The patient underwent a surgical evaluation and was offered a lumbar laminectomy. The patient was offered a facet joint capsule RF procedure in an attempt to avoid or delay surgery and was told that this was experimental, but was also very low risk. The patient opted to try the RF procedure and informed consent was obtained. The procedure involved inserting a standard RF needle with a straight 1 cm burn tip onto the posterior aspect of the facet joint where the capsule is present. Standard testing for motor and sensory inputs was performed and a local anesthetic was injected at the procedure site. With the RF needle positioned on the posterior facet capsule, we used RF lesioning for 90 seconds at 80 °C. The needle was repositioned to a total of 3 locations across the posterior facet joint from a medial-to-lateral position. The individual was seen one month post the procedure with resolution of his pain. The patient was not seen again until 2023 for a different issue involving hand arthritis, but at that time the patient stated that he still had resolution of his leg pain 10 years later. There were no complications with the procedure.

CASE 2 PRESENTATION

A 67-year-old woman presented with the complaint of left buttock and anterior leg pain in March 2021. The patient was seen by another physician who treated the patient with a sacroiliac joint injection, which gave her 50% relief for approximately one month. The primary care doctor ordered an MRI, which revealed a left-sided L3-L4 synovial cyst that was 0.7 cm and was causing moderate-to-severe central and mild-to-moderate foraminal canal stenosis at that level. Also noted was a grade one spondylolisthesis of L4-L5. In 2022, the patient underwent 4 lumbar epidural steroid injections, which offered her approximately 2 to 3 months of 50% relief, but according to the patient, the relief was getting less and less with each injection. Injection of the facet capsule was performed with one month of relief postinjection. The patient saw a neurosurgeon who recommended a 3-level fusion to correct not only the spondylolisthesis, but also the synovial cyst. The patient was offered the RF procedure of the facet capsule and was informed that it was an experimental procedure but had low risk compared to a 3-level fusion. In an attempt to avoid surgery, the patient opted for the RF procedure and informed consent was obtained. The RF procedure was similar to the other-mentioned case and was completed in September 2022. The patient was seen as a follow-up in March 2023 with resolution of her back and leg pain. The patient agreed to a postprocedural MRI, which revealed no residual synovial cyst and only mild left foraminal stenosis at L3-L4. Both a pre- and postprocedural MRI image are included in Fig. 1.

DISCUSSION

Synovial cystic stenosis is not a common issue, but when it occurs it can result in a surgical solution, which carries significant risk with a 75% successful outcome. Other options, such as synovial cyst rupture, are effective approximately 70% of the time but often require repetitive treatments. Here we present 2 patients who had synovial cysts causing stenosis symptoms that were treated with a rather simple RF technique, which is thought to result in an aperture of the posterior synovial capsule to allow leakage of the synovial cyst fluid. The procedure involved standard RF techniques to the posterior synovial capsule at 3 locations from medial to lateral along the facet joint line at the affected

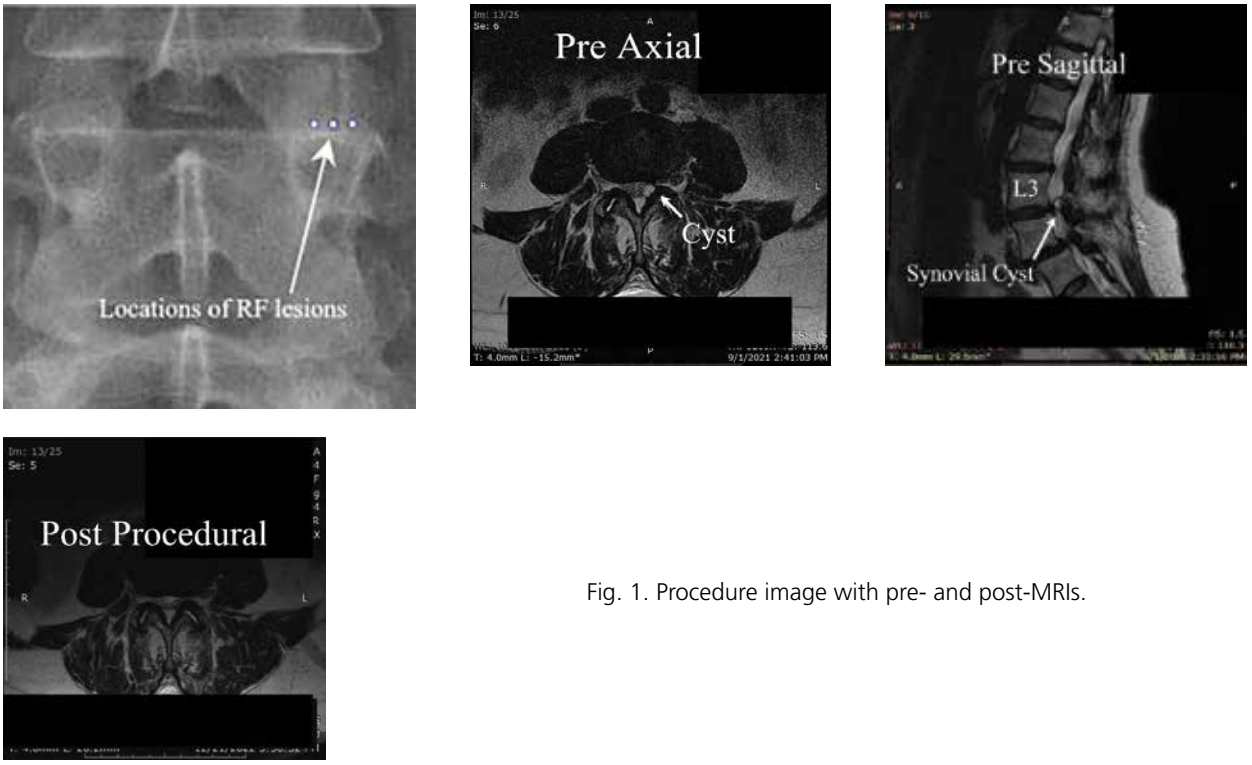

Fig. 1. Procedure image with pre- and post-MRIs.

level. There are no significant neural structures in the vicinity of the posterior facet joint, and thus risks are considered low. Creating an aperture in the posterior facet capsule could result in other unforeseen issues, but the long-term complications are probably insignificant compared to a surgical solution. The CARE guidelines were followed for this case report.

CONCLUSIONS

RF lesioning of the posterior facet capsule is potentially a viable option in patients suffering from stenosis due to cystic compression of the neural elements who wish to attempt to avoid surgical intervention.

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