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Use the Surgical Ligament Matrix with Biportal Electrical Pulses to Treat Back Injuries

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Abstract

Previously reported treatment strategies for this pain include conservative management, SI joint injection, radiofrequency denervation ablation, and SI joint fusion. Here, we describe the use of biportal endoscopic radiofrequency ablation (BERA) to treat patients with low back pain. From April 2018 to June 2020 he included her 16 patients who underwent ABR. The S1, S2, S3 foramen and her SIJ line were marked under fluoroscopy. The skin entry point was placed 0.5 cm medial to the SIJ line, at the level of the S1 and S2 foramen. Under local anesthesia, her 30° arthroscope with a diameter of 4 mm was inserted through the viewing portal. Surgical instruments were introduced through a separate caudal working portal. We resected the lateral branch of the S1-S3 foramen and the dorsal branch L5, which is the cause of SI arthralgia. At 1, 6 and 12 months post-surgery follow-up, clinically relevant improvements were noted in both the Visual Analogue Scale and the Oswestry Disability Index score. The patient's overall satisfaction rate was 89.1% for him. BERA for ISG pain treatment has the advantage that the innervating nerves to the joint are identified and removed directly. This technology allows for a wider working angle compared to traditional single-port endoscopes. Our study showed promising preliminary results.

Keywords: Endoscopy; Radiofrequency ablation; Low back pain

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Introduction

The sacroiliac joint (SIJ) is a common cause of back pain, but it can be an overlooked source of such pain. A history of trauma, inflammatory disease, or spinal surgery is a precursor to SIJ pain. Spinal or polyarthrodesis involving the sacrum increases the incidence of SI joint pain and may contribute to back surgery failure [1]. The SIG should not be over-moved and should be stable enough to transfer weight to the lower leg. However, after lumbar fusion, decreased lumbar motion can force the SI joint to rotate and increase stress on the SI joint. It is also considered a form of degeneration of adjacent segments after spinal fusion surgery [2].

To treat SIJ pain, the anatomy of the SIJ must be emphasized. The joint space, the muscles surrounding the SIJ, the ligaments supporting the SIJ, and the nerves innervating the SIJ make up her SIJ complex. SIJ pain is thought to be caused by the lateral sacral ramus, which extends from the posterior sacral foramen and innervates the interosseous and dorsal sacroiliac ligaments and joints. Previously described strategies for SI joint pain management included conservative management with stabilization or medication, SI joint injection with local anesthesia or steroids, radiofrequency (RF) denervation ablation, and SI joint fusion. . Several studies have demonstrated longer-lasting efficacy of RF ablation (RFA) SIJ complexes [3]. The concept on which this treatment is based provides denervation of the nociceptive nerves that supply the SI joint. The nerves innervating the SIJ consisted of the dorsal branch L5 and the lateral branches S1–S3 of the sacral branch, which were targeted for denervation. Choye et al. A patient with chronic low back pain secondary to the SIJ complex treated using endoscopic single-port RFA on the lateral sacral branch. Their results showed encouraging results with a patient satisfaction rate of 88.6%. This article presents a new technique involving the use of biportal endoscopic RFA (BERA) for SI joint pain management. We present surgical procedures and therapeutic outcomes and discuss the potential benefits of our

technique. We also present the surgical procedure [4].

Materials and Method

Patient Selection

We selected the medical records of 16 consecutive patients who underwent ABR for the treatment of SIG-related low back pain between April 2018 and June 2020. Primary concerns were low back pain with signs and symptoms of SI joint involvement on physical examination, conservative treatment that failed to relieve pain (including rest, administration of analgesics, and physical therapy), and persistent severe low back pain (despite prior lumbosacral surgery or pain management) lasting ≥12 weeks [5]. In addition, the enrolled patient was judged to have greater than 50% pain relief from baseline according to visual analogue scale (VAS) measurements performed after diagnosis of intra-articular and multisite lateral sacral block of the SIJ complex. Did. Finally, her 12-month follow-up of the included patients was required.

We also used the following exclusion criteria: Tumor at SIJ, previous surgery for SIJ (eg, SIJ fusion or posterior plating of SIJ due to trauma), or significant comorbidities. All patients received ABR treatment and clinical outcomes were assessed using outpatient or telephone questionnaires preoperatively and at 1, 6, and 12 months postoperatively. VAS and Oswestry Disability Index (ODI) scores were recorded preoperatively and at each follow-up time point. VAS and ODI were the primary outcome measures. We also conducted a patient satisfaction survey 6 months after surgery. All clinical evaluations were performed by one core investigator [6].

Statistical Analysis

Nonparametric statistics were used due to the small patient sample. Wilcoxon's signed-rank test was used to compare his VAS and ODI scores before and after surgery. Statistical analysis was performed and graphs were designed using SPSS version 25 (IBM Corp. (ICC/POK), USA 2017). All patients were placed in a prone position on a radiolucent table. Patients remained awake during surgery to maintain communication with the surgeon during surgery [7].

After sterile preparation and draping, an anteroposterior perspective was obtained using the C-arm. To best visualize the posterior aspect of the SI joint, we tilted the transducer cephalad to her 10°–15°. Using fluoroscopy, the S1-S3 foramen and her SIJ line were marked. The skin entry points of the viewing and working portals were separately placed 0.5 cm medial to the SIJ line, at the level of the S1 and S2 foramen. Set the S1 incision as the working portal and the S2 incision as the viewing portal [8].

3 mL of local anesthetic containing 1% lidocaine hydrochloride was injected into each inlet, and 5 mL of lidocaine was infiltrated into the space between the S1 and S2 regions. Two 0.5 cm skin incisions were then made at the entry point. Kelly forceps were used at each incision and the stump supported the space between the erector spinae (multifidus and longissimus) and the interosseous ligaments overlying the posterior SI joint. After cannulation, a 4 mm diameter 30° endoscope (Smith & Nephew, Inc., Watford, UK) was inserted through the viewing portal. During the procedure, a saline infusion pump was connected to the endoscope and the pressure was set at 20-30 mmHg. Surgical instruments were introduced through the caudal working portal.

After triangulation with an endoscope to check for minor bleeding, an ablation rod was used to resect soft tissue debris overlying muscle and interosseous ligament structures [9].

The area between the lateral border of the sacral foramen and the medial border of the SI joint was resected. The lateral nerve branches usually enter through the sacral foramen, are accompanied by feeding vessels, and are surrounded by adipose tissue. Therefore, we identified and deleted the S1, S2 and S3 collateral branches in the region lateral to the S1–S3 sacral foramen. The endoscope was then tilted further cranially to identify the dorsal primary branch of L5. It is usually located in the cranial lateral quadrant of the S1 foramen. Occasionally anastomoses with the S1 lateral plexus. The position of the HF probe tip can be checked under fluoroscopy if desired. Sacroiliac pain was induced by resecting ligamentous structures throughout the procedure. The patient found a trigger point. This should correspond to the most unpleasant points experienced in everyday life. We then removed the ligamentous structures under the endoscope without damaging the foramen structures [10].

Discussion

Treatments for intractable facet joint pain range from facet joint injections, RFA, and endoscopic denervation to facet arthrodesis. Previous studies have reported proliferative therapies injecting hyperosmotic dextrose or platelet-rich plasma into the peri- and intra-articular areas.

It has also been reported that RFA approaches, including cold RFA in SIJ, are promising approaches with beneficial therapeutic effects. The goal of RFA is to denervate the dorsal branch of L5 and the lateral branches of S1-S3, which are thought to be sources of pain signals from the SIJ. SIG fusion using a minimally invasive technique may be considered if the described treatments fail. Martin et al. We compared the short-term and long-term outcomes of SIJ fusion patients. Their pooled analysis found that the VAS score decreased on average from 80.3 to 32.2 and the ODI score from 56.2 to 34.4. However, SIG fusion required general anesthesia and prolonged hospitalization.

Previous studies reported that treatment with RFA for the SI joint complex showed longer-lasting efficacy than other treatments. RFA is a less invasive treatment performed under local anesthesia compared to SIG fixation. Therefore, we considered RFA to be a suitable solution for SIJ pain, as it provides pain relief similar to the methods described above.

Conventional RFA is performed by inserting a needle into the area between the dorsal foramen and the SI joint under an oblique anteroposterior radiograph. However, this technique is image-guided and denervates the lateral sacral branch without observing structures within the sacroiliac joint. This is because the collateral branches from S1-S3 are deeply connected to the long posterior sacroiliac and sacrotuberous ligaments. Traditional his RFA techniques tend to ablate too superficially the areas needed. Previous studies have postulated that pain in SIJ is caused by both

nerve and ligamentous structures that are difficult to reach with conventional techniques. After conventional treatment, these may contribute to pain recurrence in the long term.The reported pain recurred 6 months after his surgery, and at 72 months he was at pre-RFA levels. i am back.

An advantage of using an endoscope in this study was that it could not only directly identify the lateral sacral ramus, but also treat the pain associated with the attached ligaments. Many of our patients stated that the area of most discomfort was in the cranial third of his SIJ, which may be the area where the dorsal branch of L5 and the lateral branch of S1 converge. In addition, we were able to induce pain by gently stimulating the suspected side branch with an HF probe to confirm successful resection of the correct nerve. Studies have already shown promising results. Choye et al. reported that the mean VAS score improved from 6.7 to 2.8 and the ODI score improved from 22.2 to 12.0 6 months after surgery. Ibrahim reported an improvement in mean VAS score from 7.23 to 2.82 and ODI score from 21.73 to 19.09 24 months after surgery. Both of these studies used single-port endoscopic techniques. In contrast, we developed BERA to treat pain in SIJ and the clinical outcomes of our patients were not inferior to previous studies (VAS improved from 7 to 1 and ODI improved from 33 to 10).

Conclusions

This article presents a new technique to treat SIG pain using ABR. In our experience, BERA for the treatment of SI joint pain has the advantage that the innervating nerves to the joint are identified and removed directly better working angle than endoscope. Our patients experienced long-term pain relief and improved physical function with minimal complications.

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