

Postincisional Pain in Spinal Cord Stimulation: Incidence and Treatment

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Received date: July 29, 2016; Accepted date: August 10, 2016; Published date: August 15, 2016

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Abstract

The post incisional pain is a biological complication of the spinal cord stimulation implantation. The frequency of this condition in literature reported studies ranges from 0.9% to 12%. The causes of this pain are unclear and there is no homogeneity in the reported data. The treatment of this surgical complication is not well established with several therapy proposed. Starting from our experience we stress the need for more consistent data on the frequency and on the therapies to be used.

Introduction

The Spinal Cord Stimulation (SCS) has been used since 1967 for the treatment of drug resistant chronic pain. The evidence of efficacy of this technique has been demonstrated [1]. In lumbar Failed Back Surgery Syndrome (FBBS) and in Complex Regional Pain Syndrome (CRPS) [2]. Despite the results the rate of SCS complications is high ranging from 8% to 75% [3]. Usually the complications are divided in biological as infections or seroma and hardware related as lead fracture or Implantable Pulse Generator (IPG) malfunction.

Between biological complications there is pain or discomfort around the IPG site or pain over the lead anchor or connectors between IPG and electro catheters. These complications are present in the clinical series with a frequency of 0.9% to 12% [3-5].

Temporary pain due to processes of incision healing or due to disruption of body tissue during implantation procedures usually improves after 7-14 days. However this pain can be present within weeks or months from implantation. A particular case of pain is the fracture of electrode or of extension causing a short circuit with dispersion of electric current in subcutaneous tissue resulting in local pain: this complication can be considered as device complication.

The pathogenic mechanism of long-term postincisional pain remains unclear [6]. A variety of mechanism trigger have been suggested but the most probably cause is the spontaneous ectopic firing in the peripheral nociceptive neurons, sensitization of pain receptors due to nerve and tissue surgical injuries. This kind of postoperative pain in SCS could be compared to postoperative pain following surgery for laparoscopic ventral hernia repair [7]. In this surgery the pressure of the transracial sutures on the subcutaneous nerves as well as the irritation from the fixed mesh on sensitive parietal peritoneum cause long term postoperative pain. Moreover the presence of a foreign body like the mesh itself induces cytokine production with inflammatory reaction [7]. We have reviewed the most important study on SCS reporting the pain over or around IPG or other components of SCS device and the suggested therapies for this condition [8-16].

From 1990 to 2015 in our centre we have implanted 507 SCS devices using all kind of neurostimulator. Thirty-nine patients (7.7%)

presented pain over or around IPG side (78%). Of these patients only two required reimplant of the IPG in different side (one patient with buttock implant, one patient with abdominal pain). Other patients were treated by medical or physical therapy. The medical therapy was carried out using anti-inflammatory drugs or the drugs usually used for neuropathic pain. In the last two year the first therapy was the application on painful side of lidocaine 5% patch. In all patients the medical or surgical treatment resolved the pain.

Usually the postincisional pain is a self-limiting symptom that improves with time [11] yet in literature a surgical revision rate has been reported up to 11.8% [11]. On long-term study very few patients required a surgical repositioning [11]. The only tenderness does not require removal of the implanted material [14], but it must kept in mind that these patients underwent SCS for persistent pain treatment and, thus, they do not want to experience a new pain due to treatment. Persistent pain at implant side must be carefully differentiated from an infection of the implanted IPG [12]. Although IPG, connectors and extensors can be source of pain in thin patients in literature there is lack of percentage of this condition. In fact in patients treated with sacral neurostimulation the pain in the sacral and buttock area, where subcutaneous fat is less dense than in anterior abdominal wall is up to 24% [4]. So it should be avoided in place to place material over a bone prominence [3]. Moreover a high incidence of postincisional pain reported up to 12% [4] could be related to the large size of the IPG used also if the implant side is the anterior abdominal region. The medical therapy for this kind of pain is very rarely described.

Recently the lidocaine 5% patch has been introduced as treatment of localized neuropathic pain [17,18] and other indications for several diseases that cause pain have been suggested [19,20], although the results are contradictory [20-22]. However if this postincisional pain can be compared to local neuropathic pain topical medication with minimal systemic side effects appears to be an useful tool. Though this kind of pain improves with transcutaneous electrical nerve stimulation [23] or by physical exercise [6] the ease of use of the patch should be kept in mind. In our preliminary experience the lidocaine patch is the drug therapy favorite.

Conclusion

The postincisional pain in SCS is a quite common complication present in many clinical series, however the reported data mainly on long-term follow-up of this pain are not well described as well as the treatment is not standardized. We suggest the development of studies that clarify the pathogenesis as well as the guidelines for the treatment of this condition.

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