Complications of Spinal Cord Stimulation

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Introduction

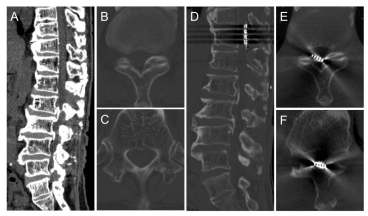
Spinal cord stimulation (SCS) provides a relatively safe treatment for intractable pain, however it has some risks. The complication rate of SCS is wide range from 8% to 75% in the literatures. We reviewed 5 complicated cases of spinal cord stimulation.

Methods

A cumulative total number of people from 2012 was 14 cases included 9 SCS trials and 5 implantations of implantable pulse generators (IPG) in this retrospective study. There were 13 men and 1 woman aged from 39 to 89 years (mean 56.2 years).SCS trial was performed for failed back surgery syndrome (FBSS) in 5 patients, syringomyelia in 2 patients, cerebral hemorrhage in 2 patients, in which implantation of IPG was performed for FBSS in 3 patients, syrigomyelia in 1 patient, and cerebral hemorrhage in 1 patient.

table. summary of cases

Figure 1. case 2

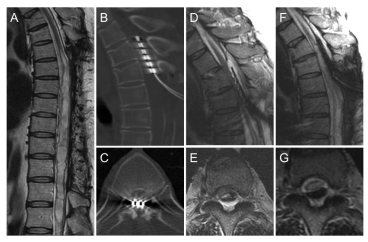


Preoperative thoraco-lumbar CT sagittal image (A) showing multi-level post-decompression and OPLL, CT axial images at the T11-12 level (B) and the T12 level (C) showing left OLF, normal canal diameter, respectively. Postoperative thoraco-lumbar CT bone sagittal image (D) and axial images at the T11-12 level (E) and the T12 level (F) revealed different position of the electrode.

Results

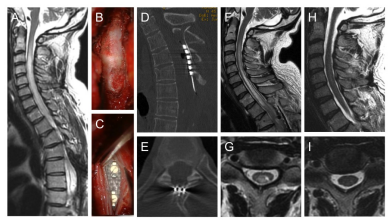
There were 5 complicated cases (35.7%), in which, a heat sensation over the IPG, a severe pain in left arm with syringomyelia due to granulation around the surgical lead, a transient motor weakness of both lower limbs after paddle lead implantation and two cases of percutaneous lead dislocation without symptoms were included. We perfomed operation for the first two cases and conservative management for the last three cases. Their three symptoms improved.

Figure 2. case 3



Preoperative thoraco-lumbar MR sagittal image (A) showing syringomyelia from T5 to conus with post-decompression. Postoperative CT sagittal (B) and axial (C) images, T2 weighted sagittal (D) and axial (E) images showing the electrode at the T11-12 level and spinal cord compressed by hyperintensity mass lesion around the electrode. After 6 weeks, the electrode surrounded hypointensity tissue (F and G) compressed the spinal cord with syringomyelia.

Figure 3. case 3 (continued)

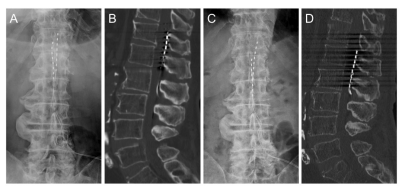


After 15 weeks, thoraco-lumbar MR sagittal image (A) showing elongated syringomyelia from C2. Intraoperative photographs demonstrated whitish granulation tissue (B) on the electrode (C). Postoperative CT sagittal (D) and axial (E) images, T2 weighted sagittal (F) and axial (G) images showing the electrode at the T3-4 level and intramedullary hyperintensity area on the left posterior horn. The thoraco-lumbar MR sagittal (H) and axial (I) images 2 weeks after second operation showing reduced intramedullary hyperintensity area.

Conclusions

Spinal cord stimulation is a useful treatment for intractable pain, however it has more or less complication.Percutaneous leads were used easily but dislocated relatively. Surgical leads (paddle type) were useful for the complex pain, however they might have more invasive complication such as syrigomyelia. The safe strategy should be needed to reduce the comlications, especially when using the surgical leads.

Figure 4. case 4



Preoperative lumbar x-ray (antero -posterior view, A) and CT sagittal (bone window, B) showing two electrodes at the T12-L1 level dorsally and postoperative lumbar x-ray (antero-posterior view, C) and CT sagittal (bone window, D) revealed electrode of the center removing caudally to the level of L1-2.