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SACRAL ROOT CUFF ELECTRODE: WHERE TINED LEAD FAILS.

Hypothesis / aims of study

Sacral root cuff electrodes (SRCE) implanted by a small laminectomy aimed to improve the quality of chronic stimulation and were first proposed in suboptimal results of Sacral Neurostimulation (SNS) in urinary retention (1). Tined lead for sacral nerve in thin or obese people may fail chronic stimulation with recurrent symptoms. Cuff electrode inside the sacral canal represents a reliable option in such cases.

Study design, materials and methods

From June 2009 to June 2010 we implanted a single SRCE in three tined lead failures. The first case (patient 1) was a 27 yrs old thin female with urinary retention due to functional outlet obstruction. Tined lead was implanted three months before recurrence of urinary retention and discomfort in the sacral area, together with failure in perception of stimulation. Evaluation of impedance revealed an open circuit in two out of the four poles. A revision was performed and tined lead replaced. Complete voiding lasted only few days, normal impedance and no displacement at X-Ray. Six months later a SRCE was implanted. In a 33 yrs old thin male (patient 2) with urinary retention due to functional outlet obstruction tined lead was implanted six months before recurrence of urinary retention and failure in perception of stimulation. An open circuit on three poles was highlighted and tined lead revised. Spontaneous voiding occurred for seven months followed by sudden acute urinary retention and failure in perception of stimulation. X-Ray highlighted the electrode was broken at the dorsal face of sacrum. Two months later a SRCE was implanted. The third patient was an obese 37 yrs old female (patient 3) with urinary retention in functional obstruction who failed SNS with the tined lead four times, implanted either on left or on the right side. At each implant voiding lasted no longer than two months as well as stimulation perception, negative X-Ray control. Failed contact of the tined lead with sacral nerve was suspected. Sacral root cuff surgery was performed 39 months after the first tined lead implant.

Results

Complete voiding occurred soon after the implant of SRCE in all of the three patients (follow up 9-21 months). Threshold for Stimulation was of 0.9 Volts (1.30-0.50). Discomfort at the level of the sacrum lasted for two days in two patients and two months in the third patient. The mean of telemetric device controls at follow-up for SNS implanted patients in the retention group is 5.4 a year. Telemetric control of percentage of usage for each program with personal programmer in the same group reveals an equal distribution among almost three out of the four programs. In our group of SRCE implants the mean of telemetric device control was 1.3 a year and only patient 1 and 3 used two different program settings.

Interpretation of results

The three patients implanted with SRCE had experienced previous failures of SNS therapy at the level of peripheral nerve. Urinary retention is a condition can be only be treated by intermittent catheterization. Complete voiding occurred soon after SRCE implant and lasted (follow-up 9-21 months) without further complications.

Concluding message

Percutaneous implant of the tined lead at the level of sacral nerve improved surgical implant for SNS as well as versatility of the procedure. A main limit of tined lead is the site for anchors, too long in thin people and inappropriate in obese ones. We are convinced that efforts have to be made in research to find new tools to be used in case of failure of SNS. In this view SRCE represents a reliable tool.

References

1. M.P. Bertapelle, M. Vottero et al.: Sacral root stimulation for treatment of urinary retention; a novel intracanalar approach using self sizing nerve cuff electrodes. Technique description and preliminary results. European Urology Supplements, Vol. 9, Issue 2, April 2010, 178

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Is this a clinical trial?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**The ethic committee of our Hospital approved the use of cuff leads as custom mode devices.**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**