

Results: A total of 33 percutaneous tibial nerve stimulation responders continued therapy with 32 and 25 subjects completing 6 and 12 months of therapy, respectively. Subjects received a mean of 12.1 treatments during an average of 263 days, with a mean of 21 days (median 17) between treatments. Subject global response assessments showed sustained improvement from 12 weeks at 6 and 12 months, with 94% and 96% of responders, respectively. At 12 months mean improvements from baseline included a frequency of 2.8 voids daily ($p < 0.001$), urge incontinence of 1.6 episodes daily ($p < 0.001$), nocturia with 0.8 voids ($p < 0.05$) and a voided volume of 39 cc ($p < 0.05$). Overactive bladder questionnaire symptom severity was significantly improved from 12 weeks to 12 months ($p < 0.01$) as well as from 6 to 12 months ($p < 0.01$). No serious adverse events occurred.

Conclusions: Statistically significant overactive bladder symptom improvement achieved with 12 weekly percutaneous tibial nerve stimulation treatments demonstrates excellent durability through 12 months. The durability of response demonstrates the effectiveness of percutaneous tibial nerve stimulation as a viable, long-term therapy for overactive bladder.

Editorial Comment

In this study, the authors reviewed the response of patients to percutaneous tibial nerve stimulation (TTNS) over a one year time period. Of the 44 subjects enrolled in the trial, 35 responded to the therapy and of those 35 patients, 33 chose to continue on with the treatment. As noted by the authors, this trial identified that the symptom improvements obtained after the initial 12 treatments were able to be continued with routine ongoing therapy. The authors identified that a longitudinal 30 minutes session every 3 weeks would help keep the symptomatic response durable.

This is an important paper to review especially in view of the increasing popularity of this technology for the treatment of the overactive bladder. Its efficacy, when used with patients who are refractory to medication, raises the consideration for use as a first line therapy. The fact that after the initial 12 weeks sessions, a treatment every three weeks sustains the symptoms makes it an attractive alternative to daily anti-cholinergic therapy. The economic comparisons of the two long term results will be very interesting. Also exciting is the potential use for patients in the institutional setting in which the side effects of anti-cholinergics such as cognitive disorder, xerostomia, and constipation could be avoided by an every 3 week bedside treatment.

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PEDIATRIC UROLOGY

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A multicenter, randomized, controlled trial of transureteral and shock wave lithotripsy -- which is the best minimally invasive modality to treat distal ureteral calculi in children?

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Purpose: Since there is insufficient evidence to determine the best treatment modality in children with distal ureteral calculi, we designed a multicenter, randomized, controlled trial to evaluate the efficacy and complications of transureteral and shock wave lithotripsy in these patients.

Materials and Methods: A total of 100 children with distal ureteral calculi were included in the study. Of the patients 50 were randomized consecutively to undergo shock wave lithotripsy using a Compact Delta II lithotripter (Dornier MedTech, Kennesaw, Georgia), and 50 were randomized to undergo transureteral lithotripsy with holmium laser and pneumatic lithotripter between February 2007 and October 2009. Stone-free, complication and efficiency quotient rates were assessed in each group.

Results: Mean +/- SD patient age was 6.5 +/- 3.7 years (range 1 to 13). Mean stone surface was 35 mm(2) in the transureteral group and 37 mm(2) in the shock wave lithotripsy group. Stone-free rates at 2 weeks after transureteral lithotripsy and single session shock wave lithotripsy differed significantly, at 78% and 56%, respectively ($p = 0.004$). With 2 sessions of shock wave lithotripsy the stone-free rate increased to 72%. Efficiency quotient was significantly higher for transureteral vs shock wave lithotripsy (81% vs. 62%, $p = 0.001$). Minor complications were comparable and negligible between the groups. Two patients (4%) who underwent transureteral lithotripsy sustained a ureteral perforation.

Conclusions: In the short term it seems that transureteral and shock wave lithotripsy are acceptable modalities for the treatment of distal ureteral calculi in children. However, transureteral lithotripsy has a higher efficacy rate when performed meticulously by experienced hands using appropriate instruments.

Editorial Comment

Citing a lack of well-designed randomized controlled trials for the treatment of distal ureteral stones, the authors of this study created a multicenter, randomized, controlled trial, which compared ureteroscopy with extracorporeal shock wave lithotripsy. They enrolled 100 children and randomized 50 of them to ureteroscopy with lithotripsy using primarily a pneumatic lithotripter. The other 50 children underwent shock wave lithotripsy. Success rates were significantly better for the patients who underwent ureteroscopy both at two weeks and at three months. The authors did have two cases of ureteral perforation in the ureteroscopy group, one of which required open surgery to correct. They cited some equipment problems as contributing to these two major complications and one also has to wonder if using a pneumatic lithotripter as opposed to Holmium laser in these patients may have also been a contributing factor. In terms of differences in minor complications, 30 of the patients in the lithotripsy group had some skin bruising and three patients developed "steinstrasse". There was some mucosal tearing noted in two patients in the ureteroscopy group, which required temporary stent placement.

Although surgical experience is not accounted for in this study, certainly this is a factor that will have an impact on success rates and complications for these modalities. The results of this randomized controlled trial favor a ureteroscopic approach to distal stones despite the fact that it is a more invasive procedure by nature. Improved instrumentation for pediatric patients as well as routine use of Holmium laser lithotripsy over a pneumatic lithotripter will likely continue to make this modality a safe and more effective option for distal ureteral stone management in the pediatric population.

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