STONE DISEASE

Chapter 1: AUA guideline on management of staghorn calculi: diagnosis and treatment recommendations

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NO ABSTRACT AVAILABLE

Editorial Comment

In 1994, the AUA Nephrolithiasis Clinical Guidelines Panel on Staghorn Calculi recommended that percutaneous nephrolithotomy (PNL) with or without adjuvant shock wave lithotripsy (SWL) (combination therapy) should constitute first line therapy for most patients with staghorn calculi. A new Guidelines panel was recently convened to review the literature from 1992 through 2003 to ascertain any recent changes in treatment outcomes for staghorn calculi. Based on their findings, the recommendation for first line treatment of staghorn calculi was PNL.

This modification in treatment recommendation since the 1994 Guideline was based on superior stone-free rates for PNL compared with combination therapy (78% versus 66%, respectively), fewer mean total procedures/pt (1.9 vs. 3.3, respectively) and comparable morbidity. Further, the panel noted a decline in stone free rates for combination therapy since the 1994 recommendations, largely due to less rigid adherence to the regimen of PNL-SWL-PNL and greater reliance on SWL to clear fragments from the kidney. With the development of improved flexible nephroscopes and the Holmium: YAG laser, PNL monotherapy is used more readily and with greater success, resulting in less reliance on SWL for treatment of residual fragments.

Once again, the Panel discouraged SWL monotherapy for treatment of staghorn calculi based on inferior stone free rates and higher mean total procedures per patient compared with the other treatment options. Although open surgery remains an option for the treatment of patients with complex staghorn calculi who might not be rendered free of stones after a reasonable number of percutaneous procedures, this option should be utilized exceptionally rarely.

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Is newer always better? A comparative study of 3 lithotriptor generations

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Purpose: At a single center we compared the efficacy of 3 generations of lithotriptors using identical protocol inclusion and followup criteria but with different modes of anesthesia.

Materials and Methods: We compared stone disintegration and dilatation of the pyelocaliceal system achieved in a prospective, randomized trial comparing the original HM3 (Dornier Medtech, Kennesaw, Georgia)

and Lithostar Plus (LSP) lithotriptors, and a matched, consecutive series of 107 treatments with the Modulith SLX. Stone disintegration and dilatation of the pyelocaliceal system were evaluated by abdominal plain x-ray and renal ultrasonography 1 day and 3 months after treatment.

Results: A total of 82 treatments with the HM3, 75 with the LSP and 107 with the SLX were analyzed, matched for stone burden and location within the pyelocaliceal system. On postoperative day 1, 91%, 65% and 48% patients treated with the HM3, LSP and SLX, respectively, were stone-free or had fragments that were 2 mm or less (HM3 vs. LSP $p < 0.001$, HM3 vs. SLX $p < 0.001$ and LSP vs. SLX $p = 0.015$). Three to 5 mm fragments were found in 7%, 21% and 35% of patients ($p = 0.006$, < 0.001 and 0.06), and fragments 6 mm or greater were found in 1%, 14% and 15% ($p = 0.002$, < 0.001 and 0.1, respectively). The re-treatment rate was 4% in the HM3 group, 13% in the LSP group and 38% in the SLX group (HM3 vs. LSP $p = 0.05$, HM3 vs. SLX $p < 0.001$ and LSP vs. SLX $p < 0.001$). Obstructive pyelonephritis occurred in 1% of the HM3 group, 8% of the LSP group and 5% of the SLX group (HM3 vs. LSP $p = 0.02$, HM3 vs. SLX $p = 0.12$ and LSP vs. SLX $p = 0.4$). All re-treatments except those in 5 patients were performed with the HM3. Therefore, the 3-month stone-free rate was comparable in all 3 groups (HM3 87%, LSP 80% and SLX 81%).

Conclusions: This study indicates that the HM3 lithotriptor disintegrates caliceal and renal pelvic stones better than the LSP and SLX machines, resulting in fewer complications and re-treatments. Disintegration with the LSP machine was also superior to that of the SLX with a need for fewer re-treatments.

Editorial Comment

Since the introduction of shock wave lithotripsy over 2 decades ago, there have been efforts under way to develop new lithotriptors that are easier to use, require less anesthesia, cause less pain, occupy less space and cost less without compromising the stone free rates achieved with the original Dornier HM3. By nearly all accounts the lithotripter manufacturers succeeded, with one critical exception, success rates. Retrospective SWL series suggested that stone free and retreatment rates for newer generation lithotripters were often inferior to those of the first generation Dornier HM3. Subsequently, Graber and colleagues showed superiority of the HM3 in a direct comparison with the Lithotstar Plus with regard to stone free and retreatment rates in a prospective, randomized trial, the only of its kind. The current study utilized data from the randomized trial in a matched pair analysis based on stone size and location with the Storz SLX and demonstrated superior outcomes with the HM3 followed by the Lithostar Plus, then the Storz SLX with regard to stone free rates, retreatment rates and post-operative obstructive pyelonephritis. Furthermore, treatment of Lithostar Plus and SLX failures with the HM3 resulted in normalization of the ultimate success rates among the 3 groups, further highlighting the ability of the HM3 to salvage treatment failures from newer generation lithotripters.

The SLX, with an even smaller focal zone and higher peak pressure than either the HM3 or Lithostar Plus, yielded poorer stone free rates than either of the other 2 lithotriptors, suggesting that peak pressure is not the sole measure of fragmentation potential. Thus, the question the authors posed, “Is new always better?” would have to be answered in the negative in this case. Perhaps lithotriptor manufacturers will take heed and learn a lesson from old technology.

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