The Clinical Case for ESWL

Lower Frequency Improves Outcomes with ESWL in Distal Ureteral Calculi

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Dear Doctor,

Extracorporeal Shock Wave Lithotripsy (ESWL) has been the cornerstone of non-invasive kidney stone management for over four decades. As the Medical Officer of Dornier MedTech, I would like to take this opportunity to introduce to you a series of articles, which together comprise “The Clinical Case for ESWL.” This article is a very interesting and important peer-reviewed article published on ESWL.

As the innovators of ESWL technology, we at Dornier MedTech continuously strive to improve and enhance the efficacy and safety of our ESWL devices. These studies utilized Dornier Delta I and Delta II devices, and continuing this rich tradition, it gives me immense pleasure to introduce to you the latest Dornier Delta® III lithotripter.

The Dornier Delta® III offers even more powerful imaging for improved stone visualization, greater penetration depth to treat more stones in more patients, and greater efficiency with time saving features. This semi-integrated lithotripter has everything you need to best manage your patients’ stones, and perhaps our most important feature, Opticouple® technology—Optical Coupling Control (OCC) which significantly improves stone free rates and lowers retreatment rates.

It is only prudent that we have a look at some of the important recent evidence published on ESWL, especially with Dornier devices. We have made a sincere attempt to present the most relevant information in a concise and lucid manner with figures where appropriate. I am sure you will find this article very useful for your clinical practice. To read other articles, please visit us at www.dornier.com.

Happy reading!

Yours sincerely,

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Medical Officer
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CLINICAL SUMMARY

This clinical summary reviews the following article from the International Journal of Urology.

Extracorporeal shock wave lithotripsy for distal ureteral calculi: Improved efficacy using a low frequency
Francisco Jose Anglada-Curado, Pablo Campos-Hernández, Julia Carrasco-Valiente, et al.

Lower Frequency Improves Outcomes with ESWL in Distal Ureteral Calculi

Background

Literature suggests that lithotripsy with lower frequency may be associated with favorable outcomes. Clinical trials with low frequency lithotripsy have focused on kidney and proximal ureteric stones.

Objective

To study the impact of two different shock wave frequencies on the fragmentation of distal ureteral calculi.

Methods

This was a prospective study involving patients with distal ureteric calculi randomized into two treatment groups (based on shock wave frequency), at 80 (High Frequency Group) and 60 shock waves per minute (Low Frequency Group). Only stones between the longitudinal diameter of 0.5 cm and 1 cm were included to reduce the impact of size. However, patients were divided into two groups according to stone size: stone size up to 0.7 cm and stone size between >7 mm and ≤1 cm. Cystine, radiolucent or tenuously calcified stones were excluded.

Treatment Protocol

A Dornier Compact Delta lithotripter was used. Patients were radiologically monitored every 100 shock waves and the shock wave intensity was scaled-up according to patient tolerance. All patients reached the maximum wave intensity of 70 mJ and majority (95%) of them achieved it before reaching 1000 shock waves. Treatment was stopped at 3000 shock waves or if there was evidence of stone fragmentation on monitoring. If non-fragmented calculus was seen on x-ray at one week, a repeat session was performed at the same frequency with a maximum of three sessions.

Primary Outcome

The total number or dose of shock waves applied.
Secondary Outcomes

- The number of sessions received
- Time to the elimination of the calculus
- The rate of resolution
- Pain perception by visual analog scale from 0 to 5

Results

A total of 150 patients, 72 in the HFG group and 78 in the LFG group, recruited between September, 2007 and September, 2009 were included in the final analysis. There was a significantly higher number of stones with size 0.7 cm or more in the HFG group as compared to the LFG group (64.3% vs. 40%; P 0.004). The investigators adjusted for this difference in their analysis.

Number of shock waves and sessions

The total mean number of shock waves was significantly higher in the HFG group as compared to the LFG group (5752±3121 vs. 2980±1211; p<0.001). The number of sessions required was lower with the LFG group (1.14±0.41 vs. 1.56±0.75; p<0.001). Both remained significant even after adjusting for difference in stone size distribution. (Figure 1)

Time to elimination

Days to elimination was significantly lower with the LFG group as compared to the HFG group (7.15±4.78 vs. 17.68±12.48; p<0.001); even after adjustment for stone size (0.006) (Figure 2)
Rate of resolution

Rate of resolution was 100% in LFG group which was significantly better than HFG group (92.9%)(p=0.02). This difference was not significant for calculi >0.7 cm.

Pain perception and complications

Pain perception was similar between the two groups (p=0.46). Minor complications like fever and renal colic occurred in 5 patients in the HFG group and renal colic occurred in 3 patients in the LFG group.

Conclusion

For treatment of distal ureteric stones, lithotripsy at a rate of 60 shocks per minute is associated with better outcomes as compared to 80 shocks per minute.

Reference


The full article can be accessed after purchase by clicking this link: