

# Initial Experience with a New Dual Shockwave Lithotripter in the Management of Upper Urinary Tract Calculi

J. Abbaraju, F. Anjum, A. Sahai, S. Madaan, H. Marsh, S. Sriprasad  
The Stone Center, Department of Urology, Darent Valley Hospital, Dartford, UK  
Dartford & Gravesham NHS TRUST

## Introduction:

- New dual shock wave lithotripters. (Duet, Direx) installed at Darent Valley Hospital since August 2007.
- We report our preliminary results with this new lithotripsy technology in the management of upper urinary tract calculi.
- The lithotripter has two independent generator/reflector system at 72° to each other.
- It can be used in synchronous (simultaneous) or asynchronous (alternate) modes.
- The dual shock waves produce a butterfly shaped focal volume which contributes to better fragmentation. And probably lower kidney damage.
- Initially we used the Duet Electrohydraulic version but lately we started to use the Duet Magna Electromagnetic version.



## Material and Method:

- Data was collected prospectively from 184 consecutive patients undergoing ESWL from August 2007 to September 2009 - performed under analgesia at 240 shock waves/min (120 shock waves/min/head).
- All patients were reviewed in the clinic at 4-6 weeks post ESWL with an X-Ray KUB.
- Stone free rates (success) was defined as completely stone free or with fragment < 3mm.



Total number of patients studied	177
Male : Female ratio	130:47
Mean Stone size	8.51 mm (range 4-19 mm)
Mean shock wave time	13 minutes



## Results:

Of the 184 patients: 152 had a single session, 23 had two sessions & 2 of them had 3 sessions. 7 were excluded from the study (3 did not tolerate the analgesia & 4 had parenchymal stones). Twenty nine patients had a ureteric stent in situ. The stone distribution included upper calyceal (10%), mid calyceal (11%), lower calyceal (60%), renal pelvis (14%) and proximal ureteric (5%). The dual shockwave asynchronous mode was utilized in 89% of the patients. Nine patients (5%) did not tolerate the procedure well and one patient was admitted overnight for analgesia. Initial Stone Free rate using the Electrohydraulic version was 78.11%. **Lately, using the Duet Magna Electromagnetic Version, (which reduces pain to the patient, allowing the use of higher energy), the Stone Free Rate increased to 83%.**



## Discussion / Conclusion:

- In an animal model using a Duet lithotripter, the kidney tissue and function were minimally affected by a clinical dose of shock waves delivered in alternating mode (120 shock waves per minute per head and 240 shock waves per minute).
- These observations decrease concern that dual head lithotripsy at a rapid rate is inherently dangerous (Handa et al., 2009 J Urol).
- Dual shock wave lithotripsy is safe, quick and effective in treating upper urinary tract calculi.