38 Dual shockwave and using High-Flow Oxygen administration by Nasal Cannula (HFONC) may improve lithotripsy results

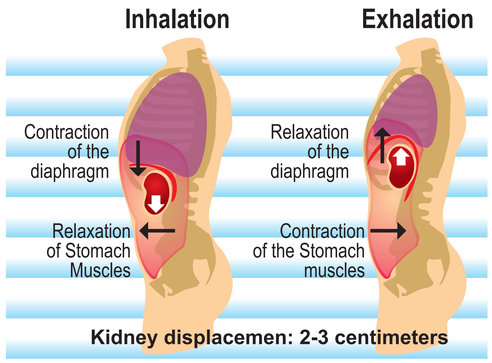
Dr. M. Gatkin, Dr. I. Raikin, Dr. A. Sopotov

Duet Magna

Introduction & Objective

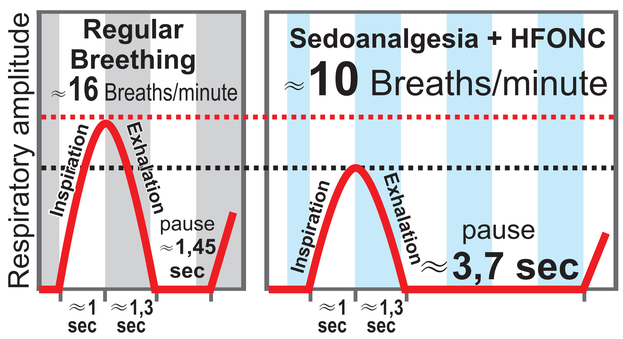
One of the factors that reduces lithotripsy efficiency is the fact that patient respiration produces continuous stone displacement, and as a result, a certain % of shockwaves are not applied to the stone (30% according to Cleveland et all*). We thought we may reduce the stone excursion by HFONC, allowing the patient to have shallow breathing. During the last 3 years we used a Dual Shockwave lithotripter (Duet Magna -Direx Systems GmbH) and HFONC device (AIRVO-2, Fisher and Paykel Healthcare –New Zealand) and the objective was to test whether this configuration has efficiency advantages

* https://www.ncbi.nlm.nih.gov/pubmed/15597649



Methods

We use the Duet Magna on a Synchronous mode, meaning that the 2 shockwave generators are fired at the same time. We use sedation (Propofol), analgesia (Ketorolac, Fentanyl) and connect the patient to the HFONC device to deliver an oxygen/ air mixture supplied through the nasal cannula of 40-45 liters per minute of oxygen concentration 40-50%. This prevents disorders of gas exchange, despite shallow breathing of the patient with a frequency of 8-12 times per minute. Patient demographic, procedure & stone data was collected prospectively from July 2013 to July 2016. A total of 720 consecutive patients attending for ESWL were treated in our center. All patients were reviewed in the clinic at 4-6 weeks post ESWL with a plain X-ray. Success was defined as stone free or stone fragments 4mm or less



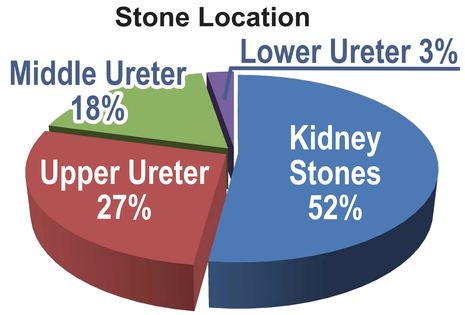
Duration of pause/minute

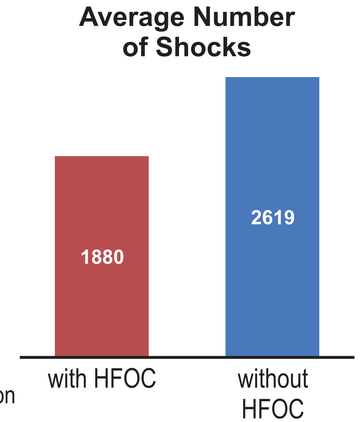
1,45x16=**23,2** sec/minute

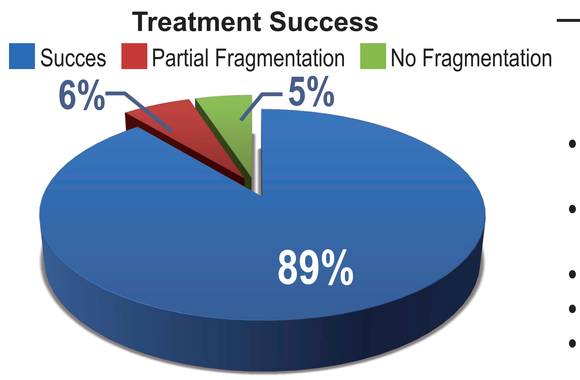
3,7x10=**37** sec/minute

Effective Treatment Time (pause) increased by **60%**

Results







- Follow up results of 685 cases
- Mean stone size was 11.8 mm.
- Range was 5 to 30 mm
- Retreatment Rate 13%
- Average Shocks - 1880

Morbidity

- Perirenal Hematomas= 0.041 %
- Steinsstrasse =3,2%
- Colic 34 = 4.7 %

Conclusion

The Duet Magna, dual shockwave lithotripter, working with HFONC is safe and very effective. The fact that using HFONC we get the stone to be almost stationary and the use of dual synchronic shockwaves allows a very fast treatment, average 1880 shocks, effective and with minimal side effects, instead of 2619 without HFONC