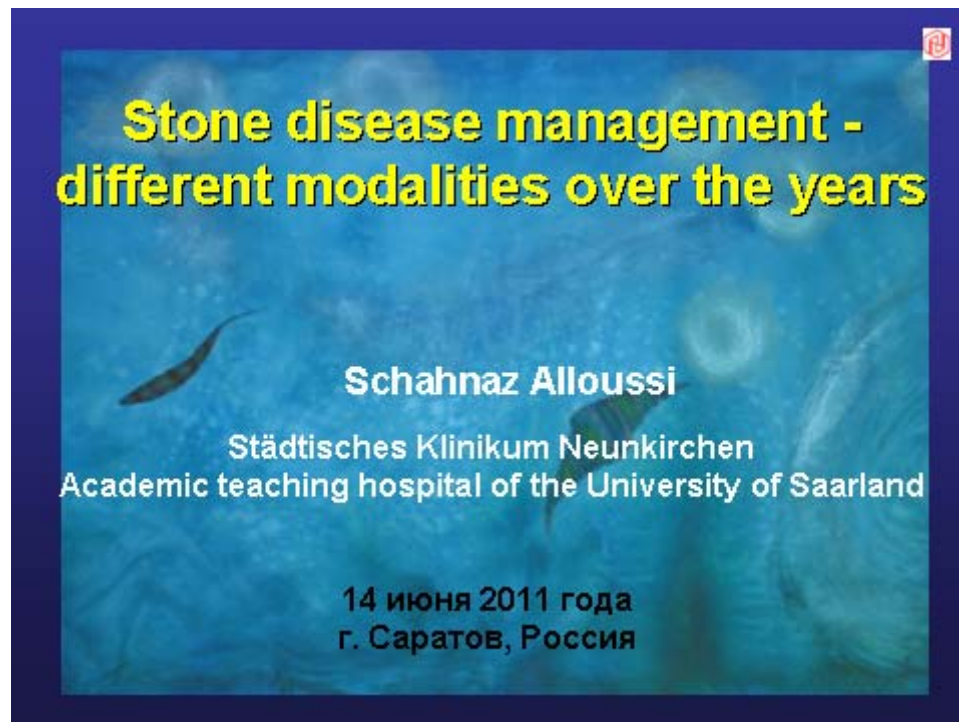


Schahnaz Alloussi

Stone disease management - different modalities over the years*Academic teaching hospital of the University of Saarland***Historical frequency (prevalence) of stone disease in
Germany**

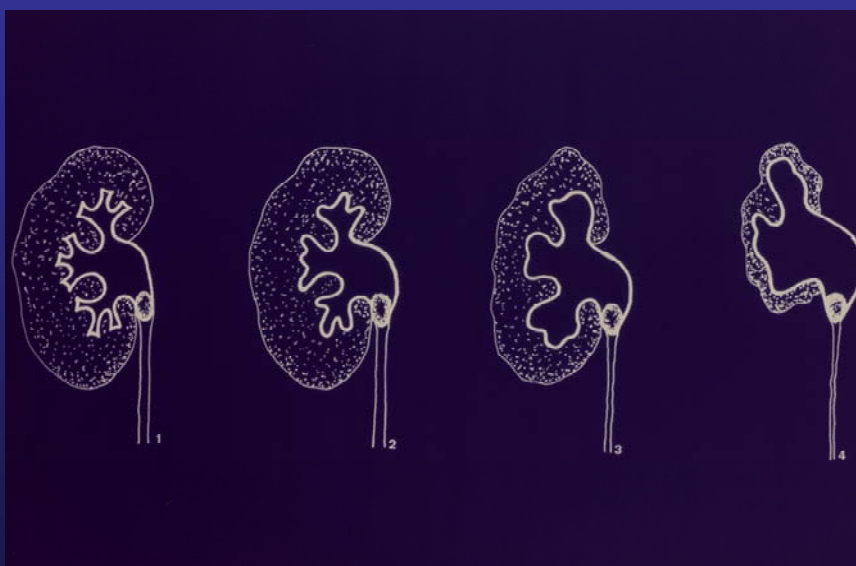
WHO 2008

Therapy of acute stone colic

An effective treatment of acute stone colic following an acute disturbance of urine passage of the UUT is finally based on the decrease of renal pelvic pressure, even influenced by pharmacology or interventionell therapy e.g. insertion of ureter catheter or percutaneous nephrostomy.

Sch. Alloussi, Ch. Lang, Urodynamik der oberen Harnwege, in: Urodynamik, 3. Aufl. 2011

Renal insufficiency





Instruments in antiquity

Lithotomy in medieval times

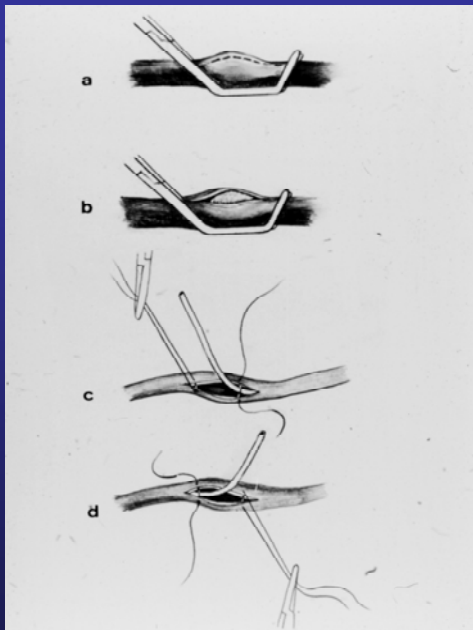
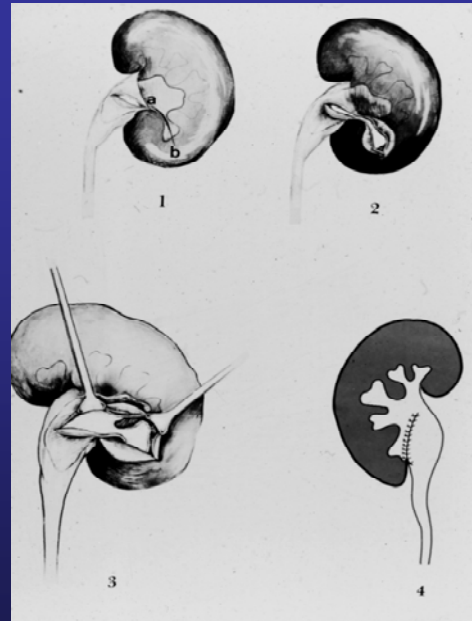


14th century
Bibliotheca casanense; Milan, Italy

“blind” transurethral destruction of bladder stone

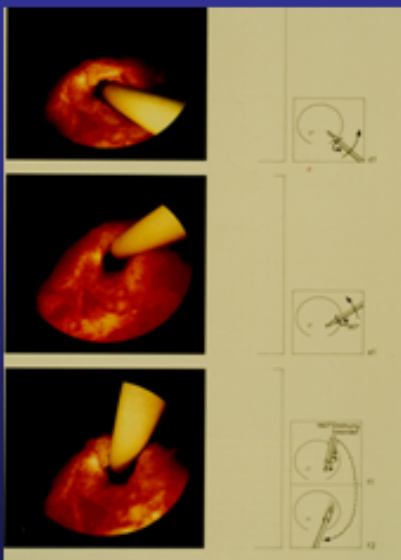
Civiale, Paris 1824



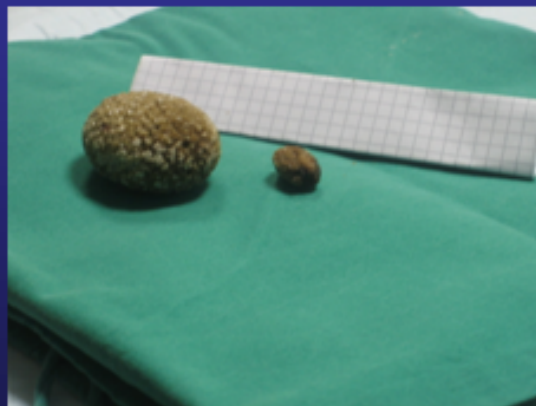
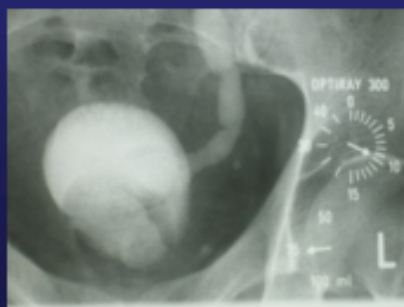
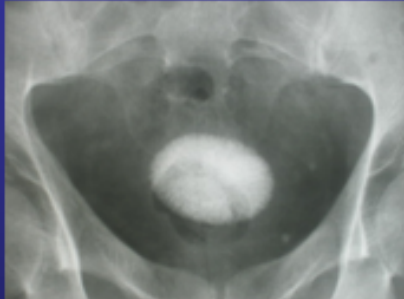
**Ureterolithotomy****Pyelolithotomy**

Loop extraction of ureter stone

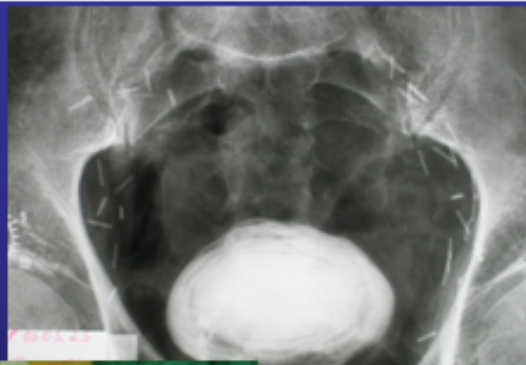
ZEISS



Sectio alta in bladder stone + stone in ureterocele



Sectio alta in Neo-bladder stone



Extracorporeal Shock Wave Lithotripsy (ESWL)



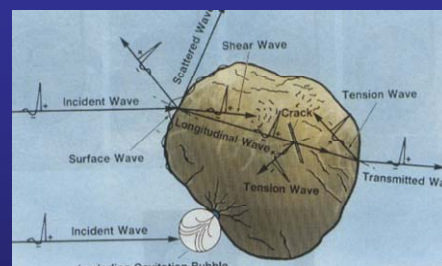
Theories of stone fragmentation

**tear and shear forces
and cavitations
Hopkinson-effect**

EISENBERGER 1977

ZHONG 1999

(high speed photography, translucent stone model)

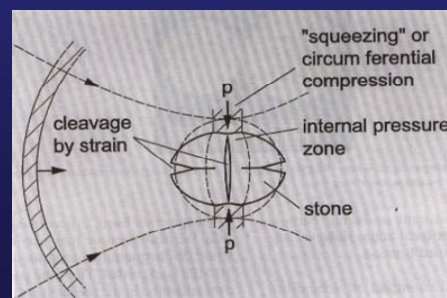


quasistatic squeezing

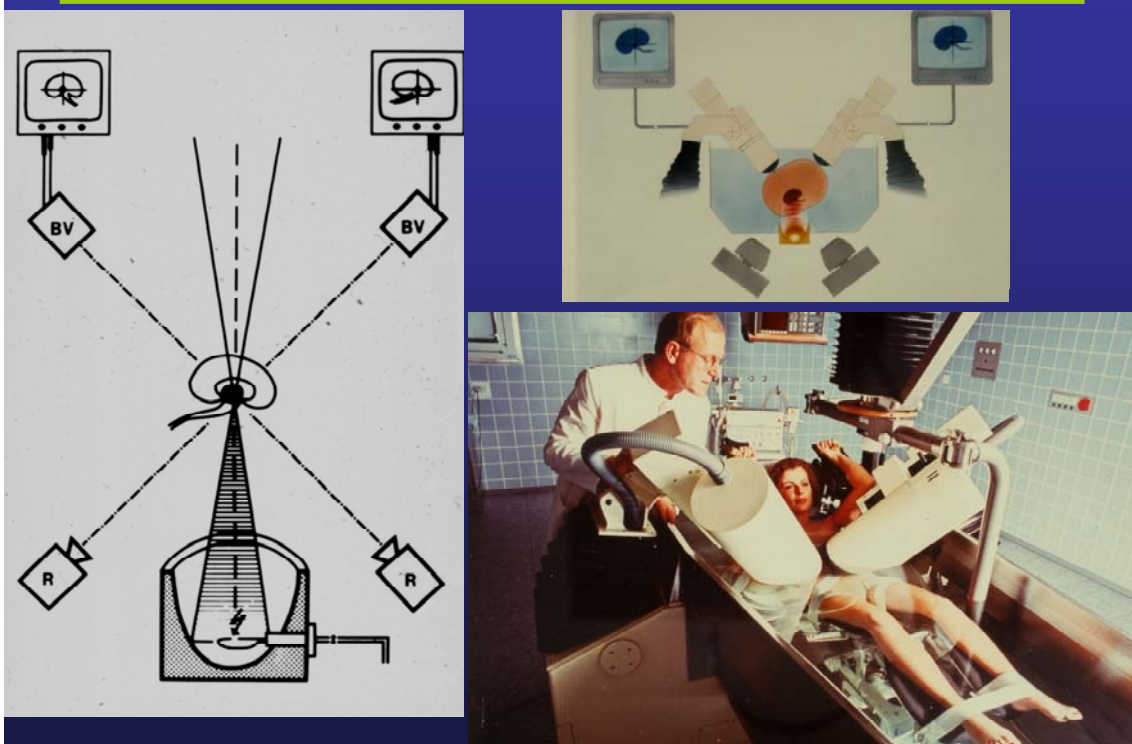
EISENMENGER 2001

dynamic squeezing

SAPOSZHIKOV 2007



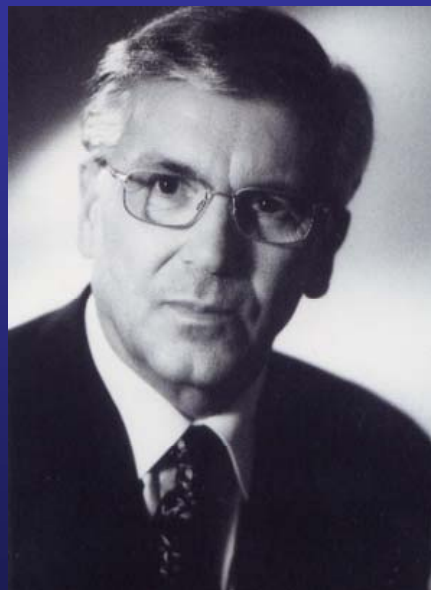
Dornier prototyp lithotripter



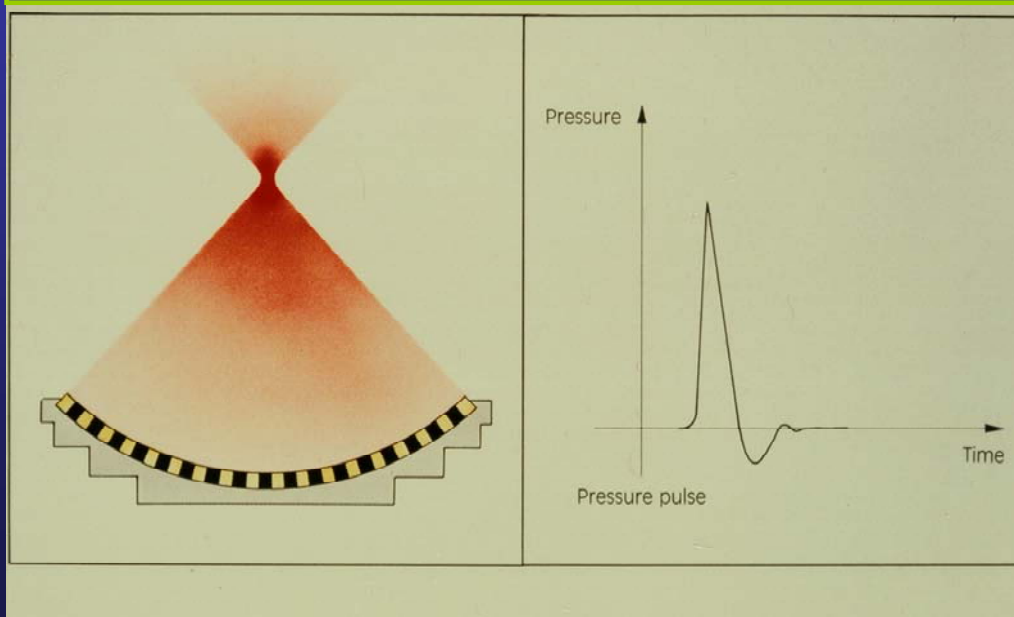
technical progress – efficacy of shock waves

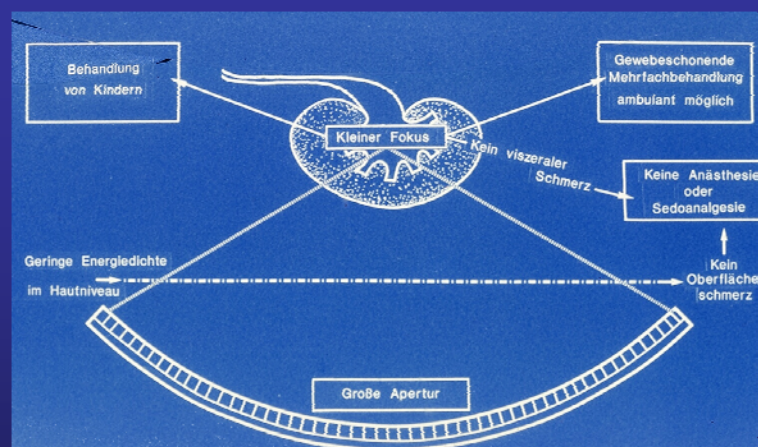
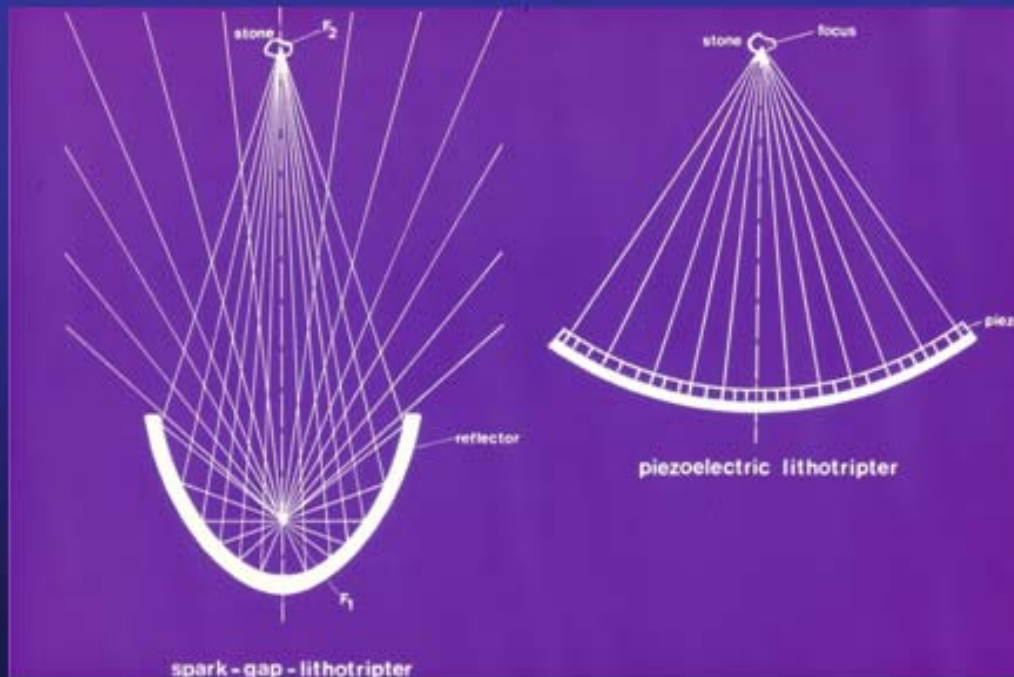
- Shock wave generation
- Focusing
- Coupling
- Localization system
 - Pain free application
 - Multifunctional use
 - Low costs
 - Easy handling

Prof. Dr. Dr. h. c. M. Ziegler



• Piezoelectric Lithotripter





- pain free treatment
- no need for anesthesia
- treatment in outpatients
- treatment in children

Contraindications for EPL

- significant and symptomatic urinary tract obstruction
- temperature $> 38,5^{\circ}\text{C} = 101,5^{\circ}\text{F}$
- blood leucocytes $> 14.000/\mu\text{l}$
- coagulation diseases
- current anticoagulant agents
- pregnancy
- anatomic deformity
- extreme obesity

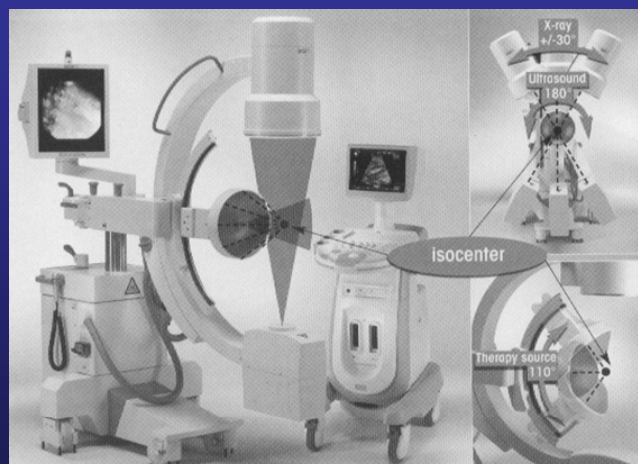
Possible adverse events in EPL

- Hematuria $< 20\%$
- urinary tract infection 1-7% (infected calculi)
- urinary obstruction due to fragments becoming lodged in the ureter
- hematoma $< 1\%$



Piezolith 3000®; Städt. Klinikum Neunkirchen

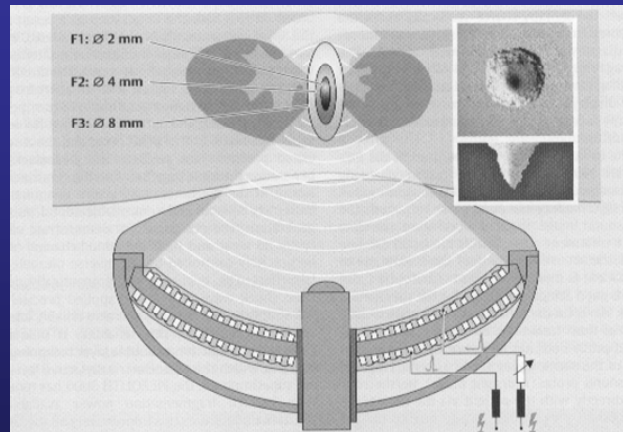
Localisation system



➤ Dual-Simultaneous-Realtime Localisation (DSR)

Therapeutic energy Application in Urology II, 2010

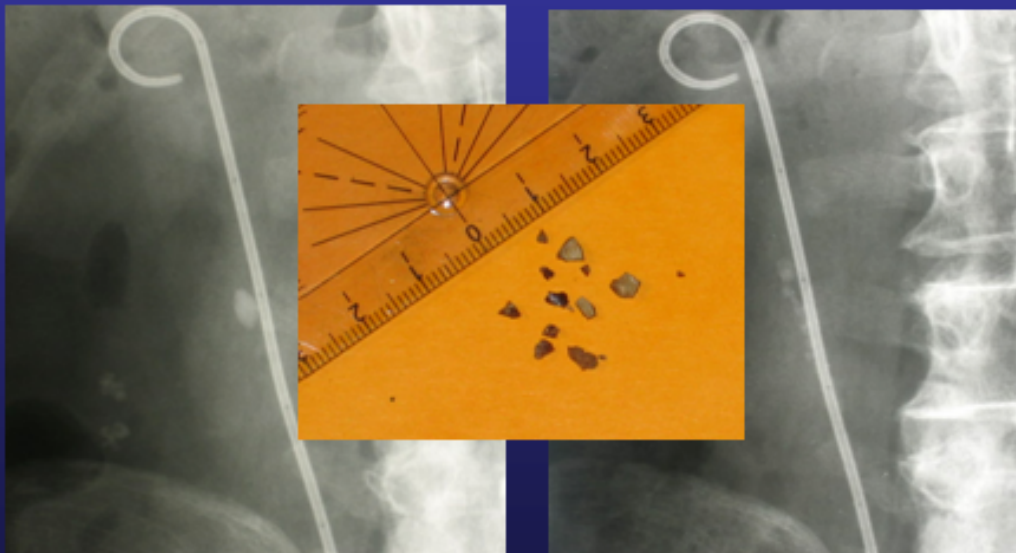
Energy generator system



- two superimposed piezo active layers (DLT) and triple focus zones

Therapeutic energy Application in Urology II, 2010

EPL of ureter calculi



EPL for bilateral staghorn kidney stone in a 55 years old woman

Conservative therapy of staghorn calculus of bilateral kidney



IVP, 10' p.i.

EPL for bilateral staghorn kidney stone

Treatment: 4000sw/ session; focus F1/F3

right kidney:

- stone free after 5 sessions
- mean average: 14.4/ 20

left kidney:

- stone free after 6 sessions
- mean average: 14.2/ 20

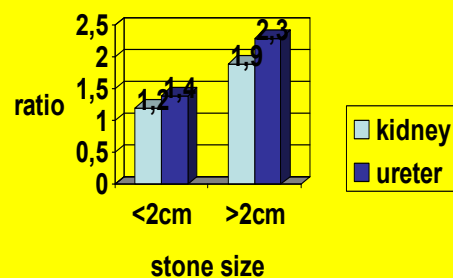
Stone Disintegration

Städtisches Klinikum Neunkirchen
Piezolith 3000®

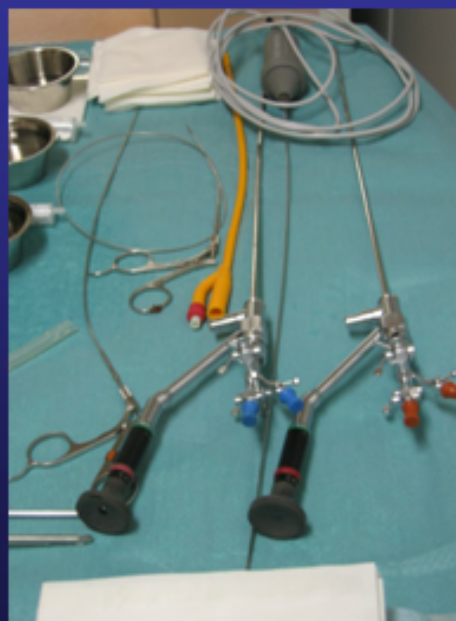
overall:

- 1067 sessions/ 486 stones since '03-'06
- Disintegration Ratio: 2,2:1
- Auxiliary measures: 15%

Disintegration ratio



Ureterorenoscopy



URS-Stondestroy

- Electrohydrolic
- Ultrasound
- Mechanical / ballistic
- Laser
- Combinations

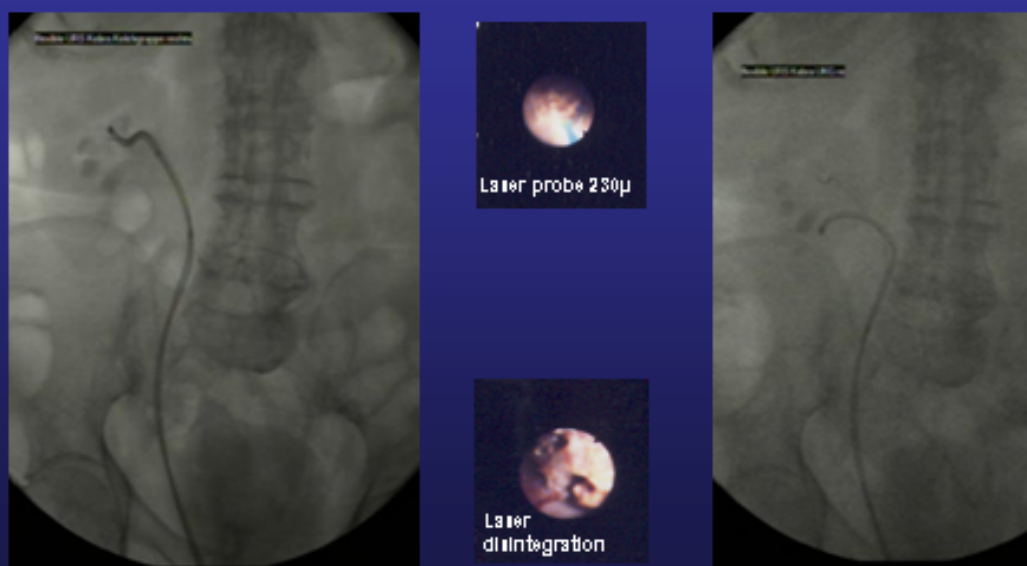
URS

- Easy to perform after ureter stent
- Significant complications <1% (MARBERGER 1998)
 - hematuria
 - urinary infection
 - ureteral perforation
 - ureteral strictures (0,35%)
- Ureteral stent postoperative
 - avoiding serious morbidity
 - increase of costs
 - patients discomfort by voiding problems and flank pain

flexible URS



Flexible URS Cobra

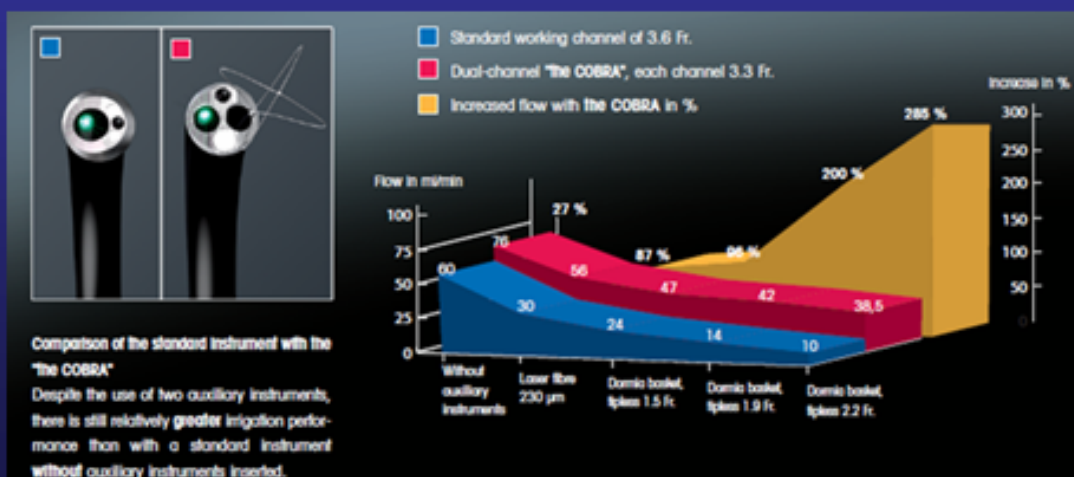


The COBRA – technical data

- distal tip: 6 Fr.
- sheath: 9,9 Fr.
- quantity of working channels: 2
- size of the working channels: 3,3 Fr. each,
for auxiliary instruments up to 3 Fr.
- deflexion: 270° upwards / downwards
- working length: 680 mm
- Viewing direction: 0°
- angle of view: 85°
- laser shifter: for fixation and movement of the laser fiber to a limited stop
- control lever: with position detent at 0° at racked distal tip
with brake to fix a requested position

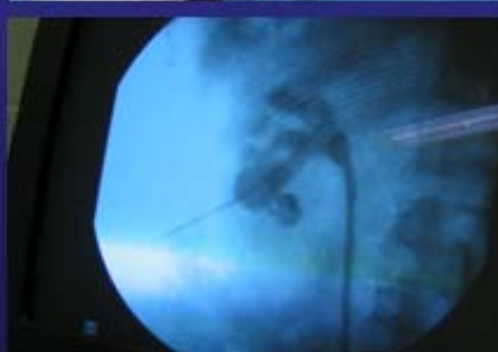


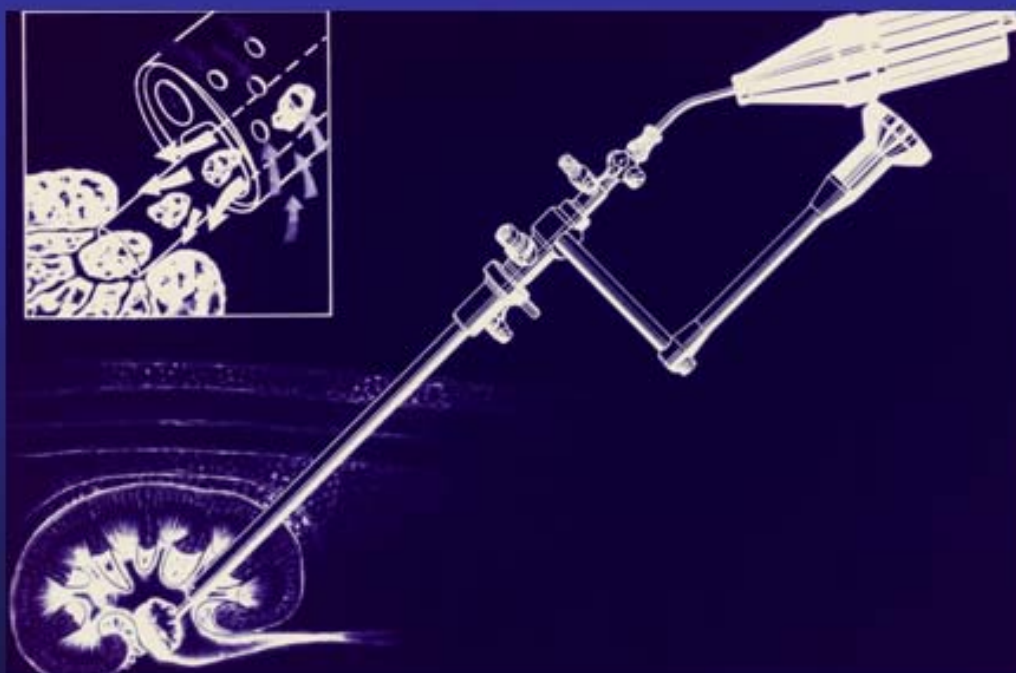
Flow-data Cobra



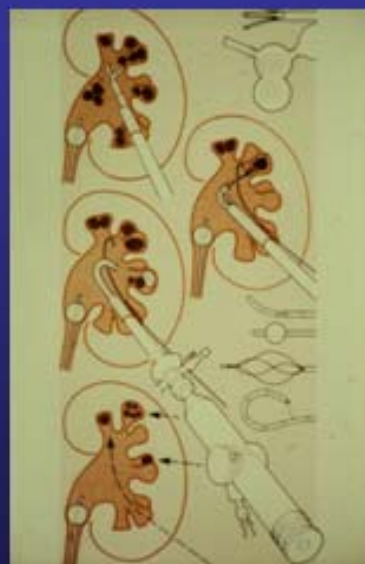
Data from manufacturer

Percutaneous access for Nephrolithotomy (PCNL)





**Flexible and rigid
Nephroscope for
PCNL**



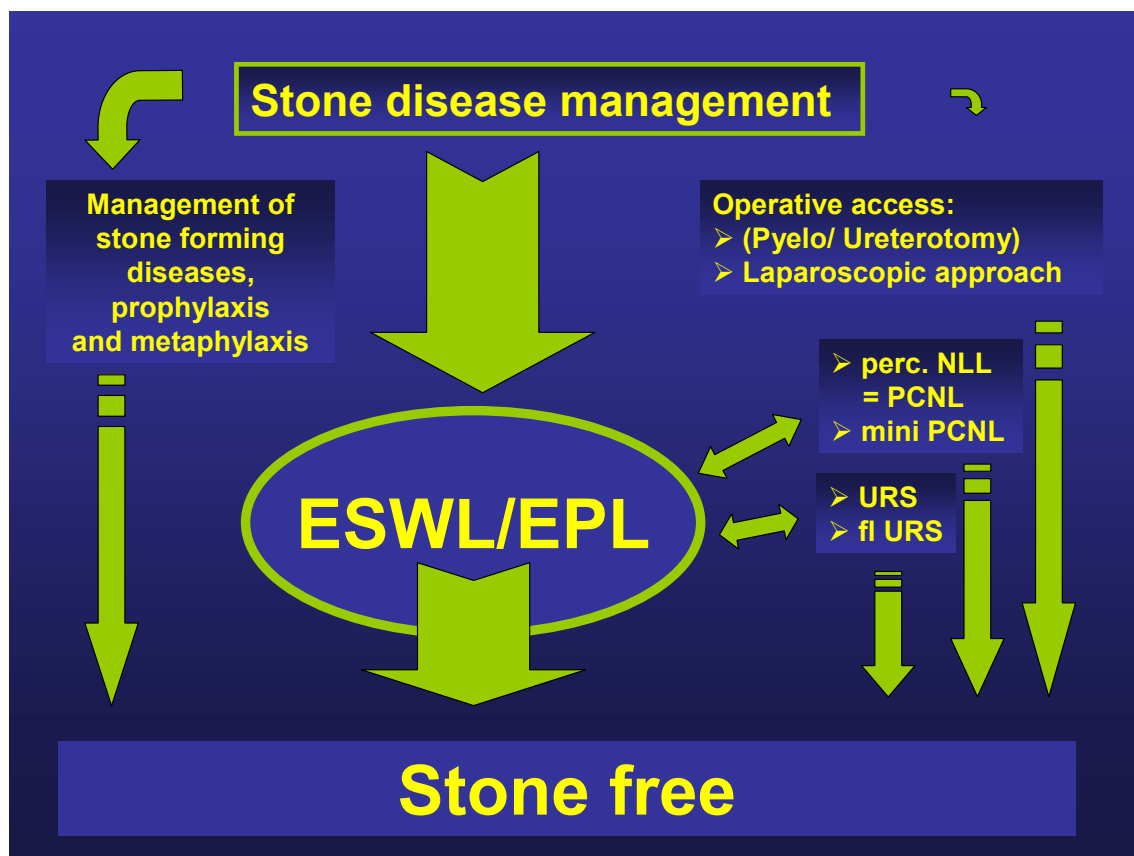
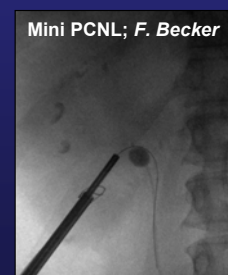
Mini PCNL

System: Miniatur-Nephroskopie-Set nach Nagele (modified version with prolonged sheath; 16,5 Ch.)

Results of the first 49 treatments in mini PCNL

F. Becker, University of Saarland, Homburg, 2009

- miniPNL easy to establish for calculus >1cm
- Stone free rate 92%
- Rare complications, conservative controlled
- Indication, stone localisation, correct puncture and standardised setting most important for success



Future ... = "Minilith 2025



Finally...

Last hope
Abra cadabra,
here comes a medication
for kidney and bladder
stone elimination

