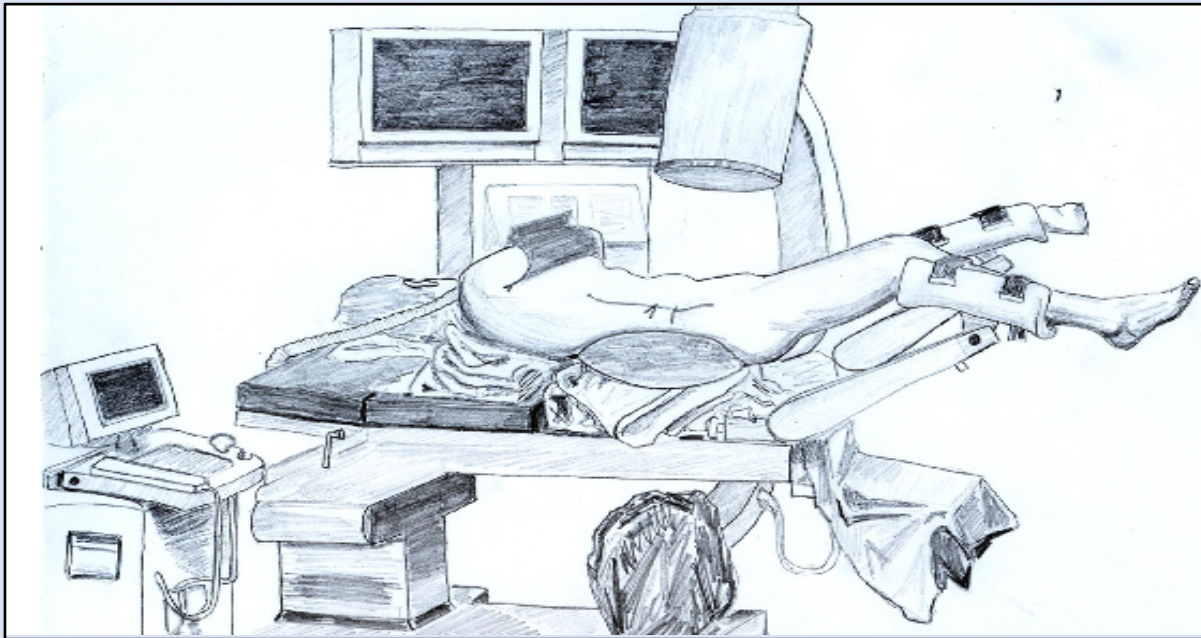


# **SUPINE position PNL**

## **The evolution**



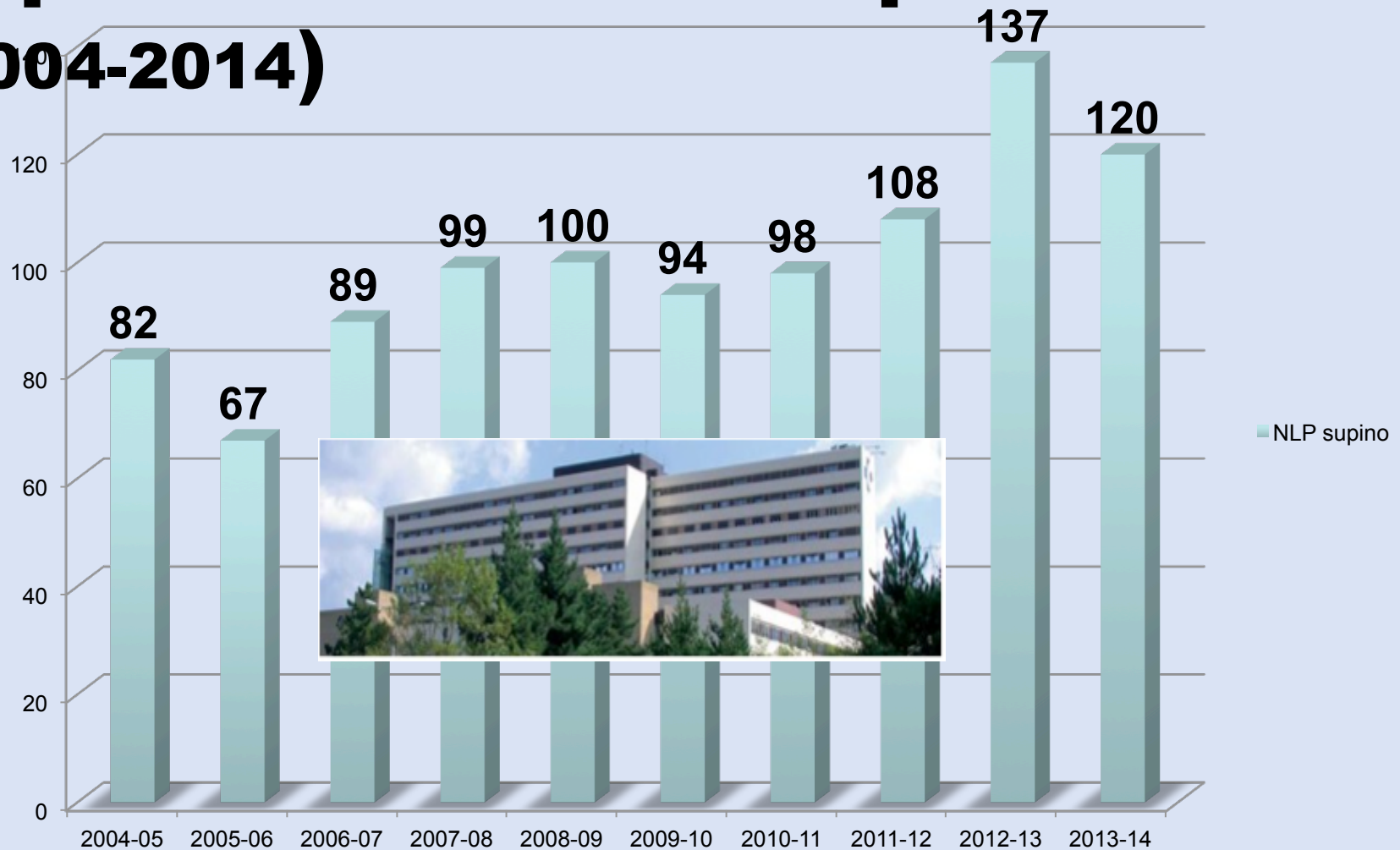
***Dr JG Pereira***

**Head of Urology Department. GALDAKAO HOSPITAL**  
**Basque Country. Bizkaia. SPAIN**



**EAU15** | **MADRID**  
20-24 March 2015

# Supine Percutaneous procedures (2004-2014)



*We started PNL in prone position (1985 -1993 -1999)*

*Since 1999 more than 1.500 procedures in supine position*

**Galdakao modified supine Valdivia position (GMSVP)**

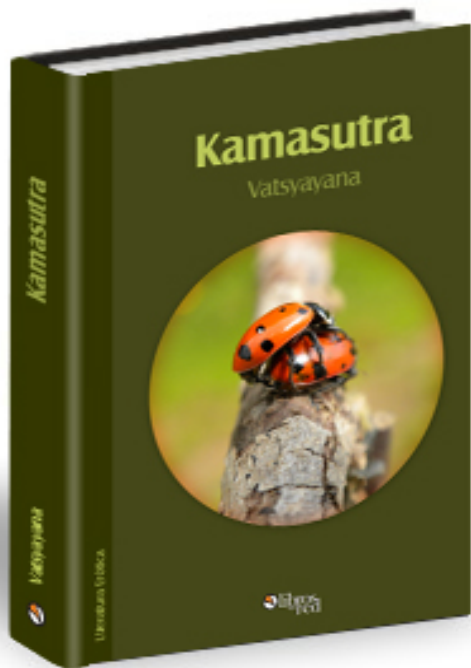


## ... which is the best patient position to perform PNL?

*“There are as many surgical positions as surgeons and patients...safety and ergonomics must be warranted”*



If you're going to perform a PNL... you definitely need to know a lot about .....





# Advantages in prone PCNL

1. Wide surgical field for renal puncture.
2. More potential access sites.
3. Easier upper calyx puncture.
4. Better free nephroscope mobility.
5. Good distension of the collecting system.
6. Shorter learning curve.
7. Less risk of visceral damage?.
8. Feasibility of bilateral procedures.



# Disadvantages in prone PCNL

1. Reduce 24% cardiac index.
2. Worse tracheal access and ventilatory problems.
3. Increase risk of peripheral nerve damage and ocular injury.
4. Slightly higher risk of colonic injury.
5. Worse residual stone fragments washout due to high amplatz sheaths angle.
6. Difficult retrograde access if needed.
7. Higher Xray exposure (*hands*).



# Supine positions

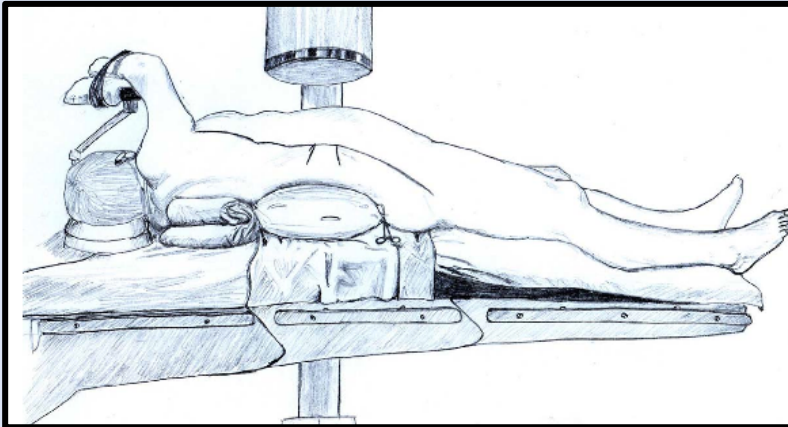
- 1987 Original supine position (*Valdivia JG*)
- 2007 GALDAKAO (GVMSP) (*Ibarluzea JG*)
- 2007 Supine anterolateral (*Cormio L*)
- 2008 Complete supine (*Falahatkar S*)
- 2008 Barts frank free supine (*Papatsoris AG*)
- 2011 Semisupine position (*Xu K*)
- 2012 BARTS Flank-free modified (*Desoky EAE*)
- 2012 Oblique supine decubitus (*Arrabal M*)



Valdivia JG J Urol 1998

# Supine position I

## “ORIGINAL VALDIVIA SUPINE POSITION (1987-88)”



*“Patient in supine position with a 3-litres saline bag below ipsilateral flank. Landmarks: posterior axillary line, iliac crest and XII costal edge”.*



*“Valdivia’s original position variation: legs are flexed in supports with ipsilateral leg more elevated and contralateral more descend to facilitate rigid uretroscope use”.*

*VALDIVIA JG Why is percutaneous nephroscopy still performed with the patient prone? J Endourol 1990;4:265-8*





# Supine position II

## “ GALDAKAO MODIFIED SUPINE VALDIVIA POSITION “ (2007)



*“Slight lateralisation of Valdivia supine position, with contralateral leg fixed and flexed and **ipsilateral slightly extended** in leg supports achieving a modified lithotomy position. Intermediate supine-lateral position with a **3-L bag filled with air** to raise the **flank 20 to 25°**”*

# Supine position III



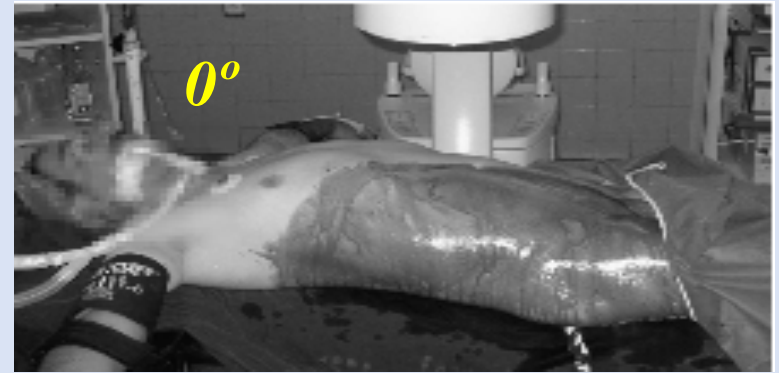
## 2007 “SUPINE ANTEROLATERAL”

*CORMIO L : UROLOGY 2007;69:377-380*



## 2008 “BARTS FLANK FREE SUPINE

*PAPATSORIS AG: J Endourol 2008;22:2665-6*



## 2008 “COMPLETE SUPINE”

*FALAHATKAR S: J ENDOUROL 2008;22:2513-7*



## 2011 “SEMISUPINE”

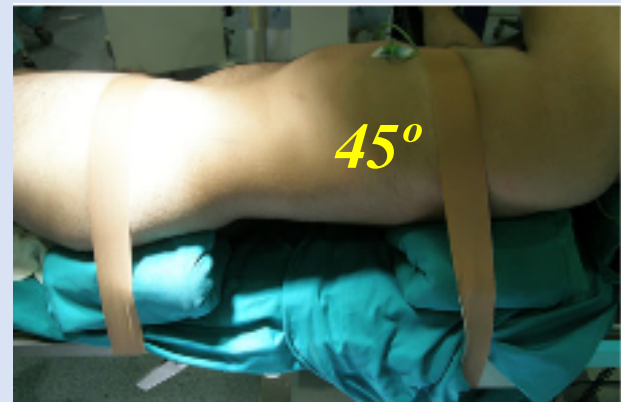
*XU K-W.Urol Res 2011;39:467-475.*

# Supine position IV



## 2012 FLANK FREE modified SUPINE

*DESOKY EAE: Arab J of Urol 2012;10:143-148*



## 2012 “OBLIQUE SUPINE DECUBITUS

*ARRABAL M. Urol Res 2012;40:587-592*



# SUPINE POSITION MODIFICATIONS

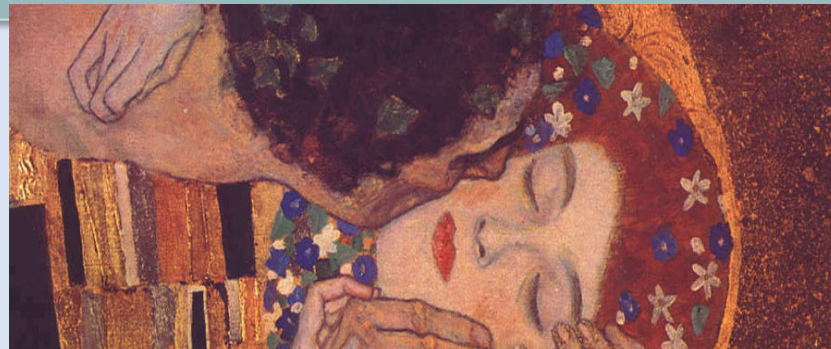
1. *Flank-Free variations* (with shoulder and hip cushions) look forward *increasing flank working space*.
2. Variations concerns *legs position* in order to enable *combine approach* for complex stones.
3. Differences in *flank elevation angle* from *0°-15°-20°-30° to 45°* searching for *better calyx access* avoiding visceral damage.





# Advantages in Supine PCNL

- 1- Optimal cardiovascular and airways control.
2. Better in high risk patients with heart failure-obese.
3. No patient repositioning is needed.
- 4- *Better stone fragments washout due to horizontal-dorsal sheaths angle.*
- 5- Less risk of colonic injury.
- 6- Opportunity of *combined approach.*
- 7- *Less overall X-Ray expousure.*



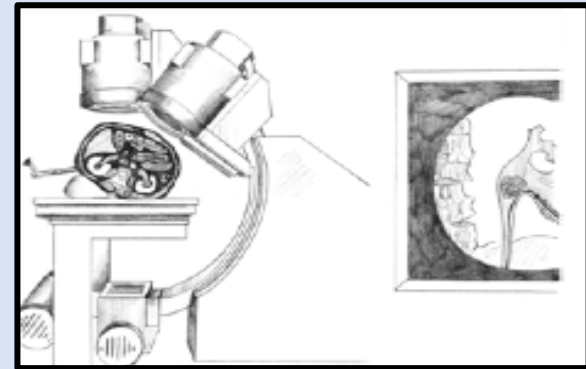
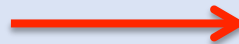
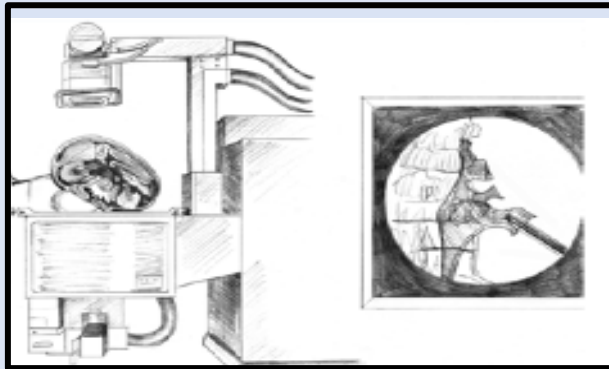
# Disadvantages in Supine PCNL

1. *Limited space* for renal puncture and nephroscope mobility.
2. *Upper pole calyx* more medial and **challenging**.
3. More *complex dilation* due to high kidney mobility.
4. Increase risk (in upper pole) of spleen-liver injury.
5. Decrease filling of the collecting system.
6. Spinal interposition in Xray PA projections.
7. Longer tract length.

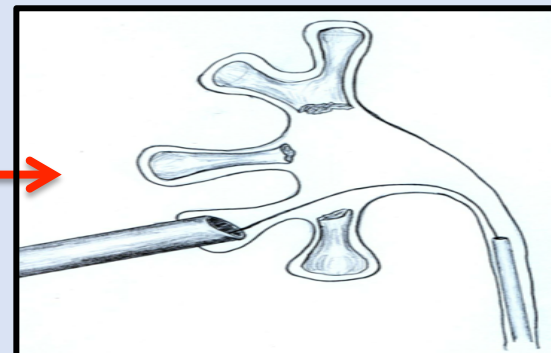


# **PROBLEMS & SOLUTIONS in GMSVP**

- **Spinal interposition Xray**--- **C arm orbital 15-20° rotation**

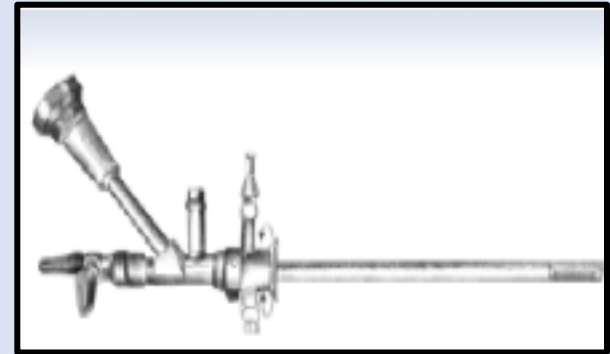
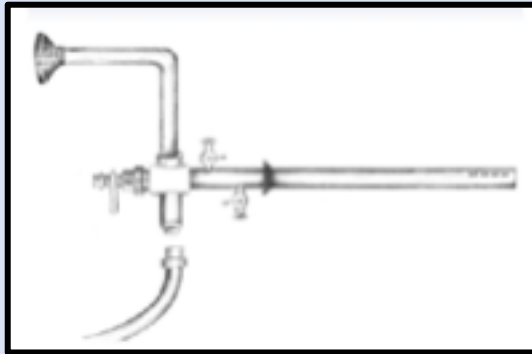


- **Challenging dilation manouvres** due to anteriomedial kidney dislogement in supine --- **“Through and through” guidewire passage** allow us to fix kidney during dilation manouvres.

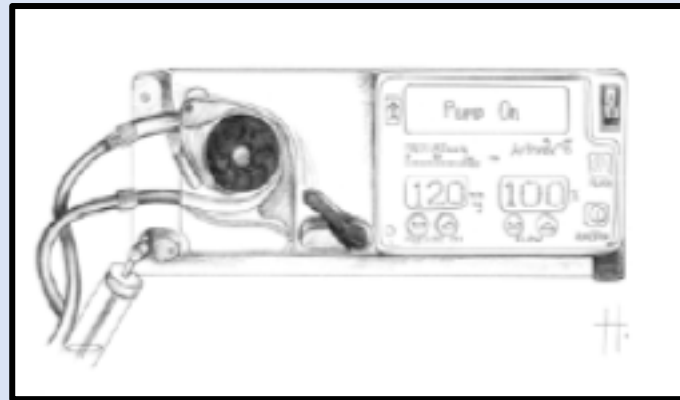


# **PROBLEMS & SOLUTIONS in GMSVP**

- Limited surgical field on flank and nephroscopies table clashing (-12-15°) -----adequate rigid nephroscope or flexible devices.



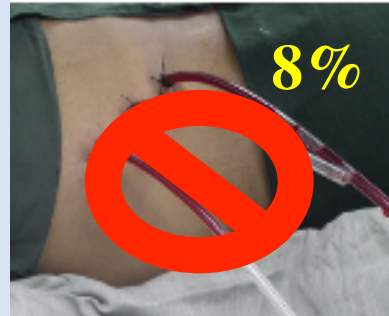
- Decrease filling of collecting system due to low pressure -----irrigation perfussion pump/ additional retrograde irrigation.



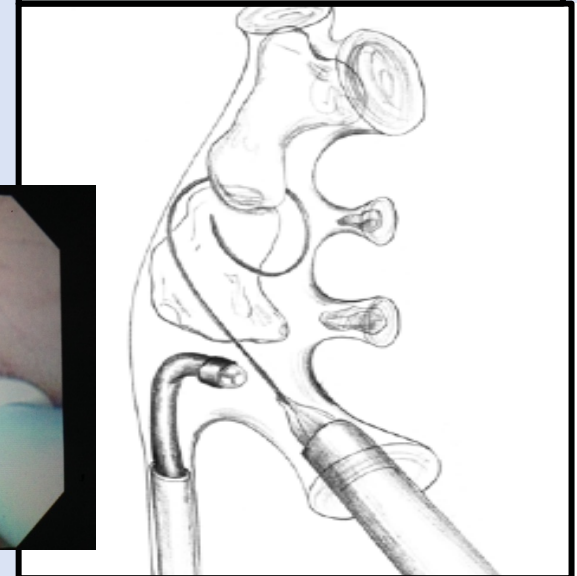
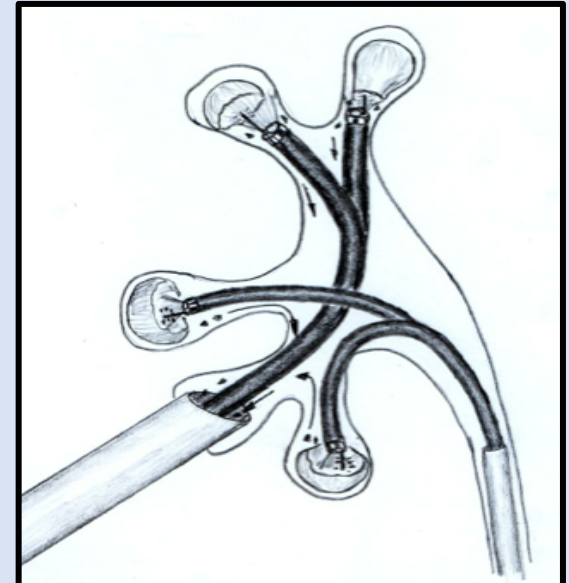
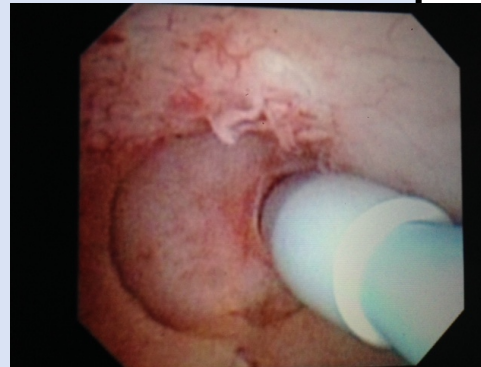


# PROBLEMS & SOLUTIONS in GMSVP

- Challenging multiple tracts due to reduce flank space---**GMVSP** allow us **ECIRS** so multiple access are seldom required.



- Reduce X-Ray exposure due to more lateral approach-----**Endovision Punction.**



# Metaanalysis prone vs supine



**Supine versus prone position in percutaneous nephrolithotomy for kidney calculi: a meta-analysis**

Peng Wu · Li Wang · Kunjie Wang

Int Urol Nephrol **2011**;43:67-77

**“Less operative time (30 min) & similar SFR (82,4 vs 82,1%)”**

**A study on comparative outcomes of percutaneous nephrolithotomy in prone, supine, and flank positions**

Hossein Karami · Reza Mohammadi ·  
Behzad Lotfi

World J Urol **2013**;31:1225-1230

**“Less SFR (86% vs 92%) and less operative time (14min)”**

**Lower pole stones: prone PCNL versus supine PCNL  
in the International Cooperation in Endourology (ICE)  
group experience**

Francesco Sanguedolce · Alberto Breda · Felix Millan ·  
Marianne Brehmer · Thomas Knoll · Evangelos Liatsikos ·  
Palle Ooster · Olivier Traxer · Cesare Scoffone

World J Urol **2013**;31:1575-1580

**“Better in supine in high risk patients and  
multiple lower calyx stones”**

## Is the supine position superior to the prone position for percutaneous nephrolithotomy (PCNL)?

Xiaohua Zhang · Leilei Xia · Tianyuan Xu ·  
Xianjin Wang · Shan Zhong · Zhoujun Shen

Urolithiasis 2014;42:87-93

9 studies: 4.918 (prone) vs 1.449 (supine)

*“ Slightly better SFR in prone (77,3% vs 72,9%) and less OT in supine (21,7 min)”*



## Percutaneous Nephrostolithotomy: An Assessment of Costs for Prone and Galdakao-modified Supine Valdivia Positioning

Justin I. Friedlander, Brian D. Duty, Arthur D. Smith, and Zeph Okeke

Urology 2012;80:771-775

GVMSP PCNL *is more costly* (1.300 \$)

- *two surgeons* (1.987\$),
- *more equipment use with greater instrument repair costs*



# Conclusions I

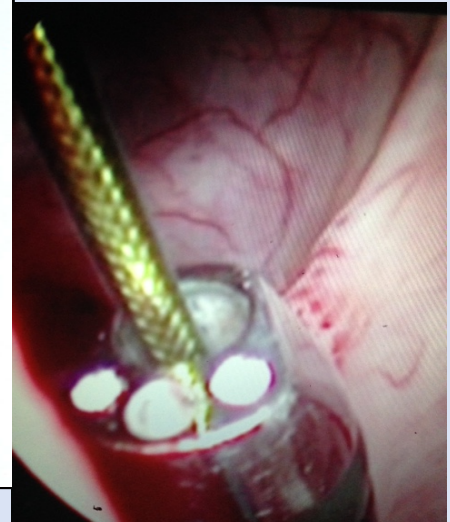
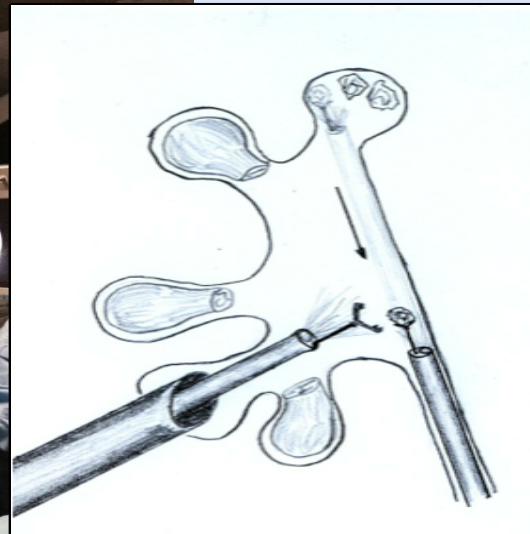
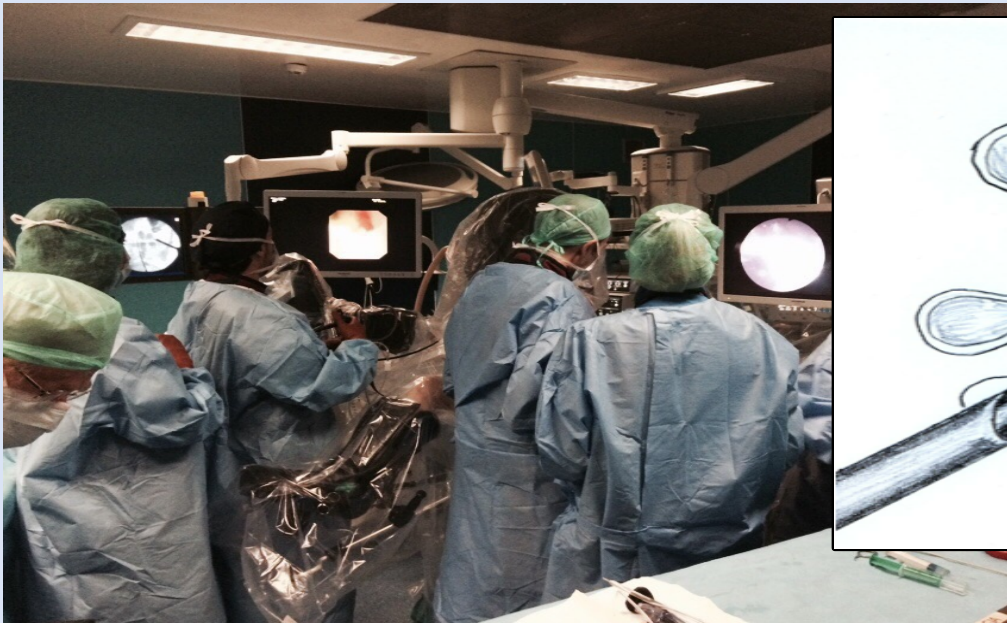
- Slightly better results in SFR in prone (77% vs 70%) (*not in combined*).
- **Less operative time** in supine vs prone (20-30 min).
- **Better** in multiple lower pole stones, in high risk and obesities patients, and in ectopic pelvic and transplanted kidneys.
- **Similar** results in complications rate, hospital stay, bleeding transfusion rate and fever (slightly higher in prone) and less Xray hazard.
- **Better** in selected cases with **renouretral stones** due to **ECIRS** availability in supine.



De la Rossette J. Eur Urol 2008;54: 1262-1269

# Conclusions II

*Supine position is major contribution to **modern endourology**, allowing us to perform combined approach (ECIRS) increasing single session SFR.*



*Mental attitude to technological and human synergy increasing surgeons **versatility** and adherence to patient needs.*



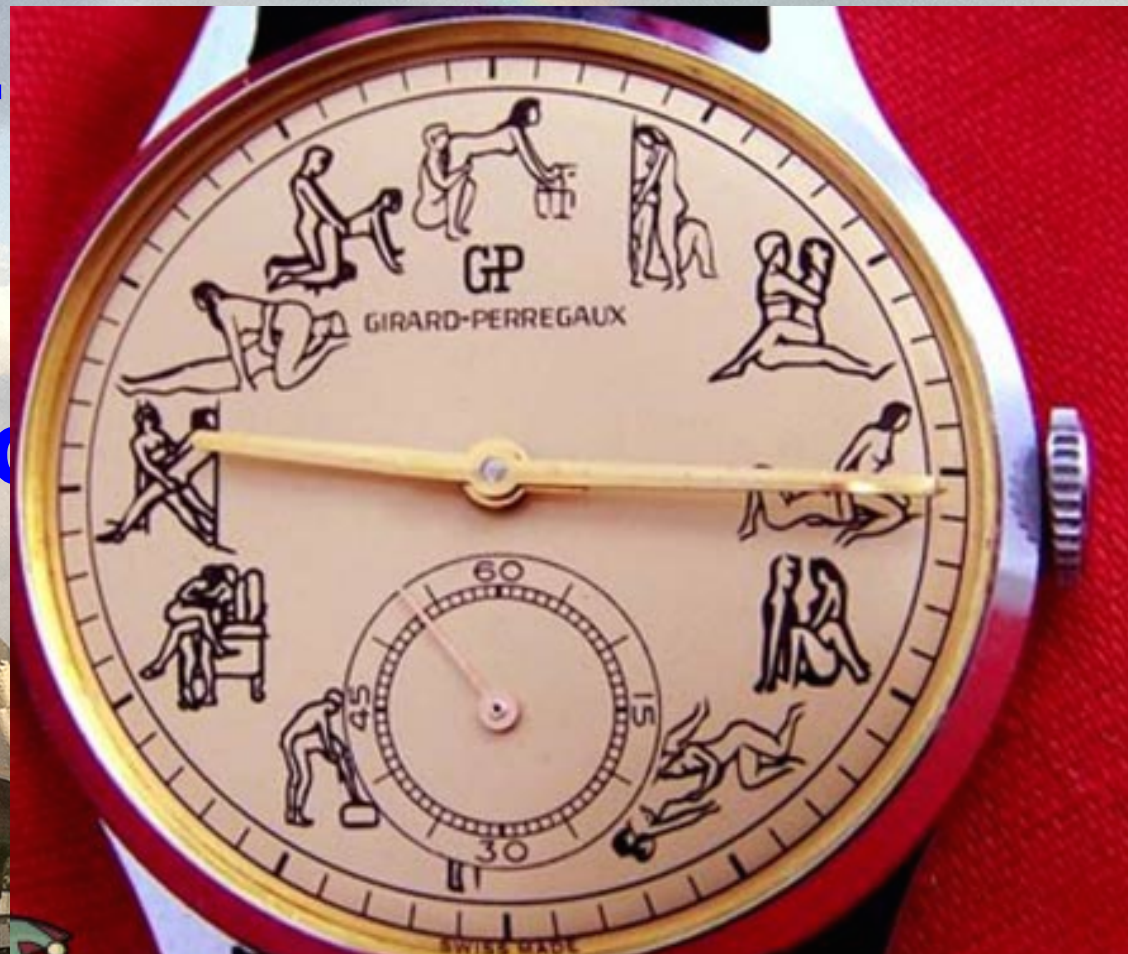
ii Switch to supine....

.....

tion ii

... and

bine ii



THANKS for patience & attention iii