

# Urology

# Frequency of urological problems

- urolithiasis (3-7% of the population)
- incontinence (20-70% of older women)
- subvesical obstruction in benign prostatic hyperplasia (50% of men)
- prostate cancer (the most common cancer in men, the second cause of Ca death in men).

# Symptomatology of urological diseases

- The entire urogenital system should always be examined for every symptom of urological disease history of:
  - pain, temperature, micturition character
  - injuries, CNS diseases, childhood diseasesthe basic requirement is always
  - urine examination chemically, microscopically and biochemically, measuring micturition frequency and volume

# Changes in urine appearance

- **macroscopic hematuria** (by color - intensity and age of hematuria),  
**uretrorrhagia** (bloody discharge from the urethra),  
**pyuria** (purulent, sometimes stinking urine),  
**hemoglobinuria** (urine stained with free hemoglobin in the absence of erythrocytes),  
**pneumaturia** (air in the urine when fistula between intestine and urinary tract),  
**crystalluria** (it is obligatory in older urine)  
**chyluria** (communication with the lymphatic system in filariasis, rare

# Pathological changes in the amount of urine

- **Quantity changes**

  - Polyuria**

    - increased urine in 24 hours

    - Beware, frequent urination is **polakisuria!**

  - Oliguria**

    - drop of dispensing below 300 ml / 24 hours

  - Anuria**

    - prerenal, renal and subrenal

# Urological symptoms

- **stranguria** (cutting during urination)
- urgency** (urge to urinate)
- polakisuria** (frequent urination)
- nocturia** (nocturnal urination)
- anuria** (absence of urine)
- retention** (urinary retention in the bladder)
- incontinence** (failure to retain urine)
- enuresis** (nocturnal incontinence)
- residue** (urine residue after urination)

# Urinary disorders

- Incontinence
    - stressful
    - urgent
    - reflective
    - from overflow (ischuria paradoxa)
- Enuresis nocturna
- Nykturia (release of retained urine)

# Etiology of urinary disorders

- **Urgent urination**- frequent, painful urination  
- inflammation, combination with tumors, foreign bodies, stones, TB, interstitial cystitis
- Retarded, delayed urination** - benign prostatic hyperplasia
- Prolonged urination** - a thin stream
- Intermittent urination** - valves, stones
- Urination in parts** - diverticulum, reflux
- Retention, residue** - residual urine in subvesical obstruction



# Pain of the urogenital system

- **Kidney**
  - nephralgia
  - how many
- **Bladder**
  - mostly associated with micturition disorder
- **Uretra**
  - rusty or burning
- **Prostate and seminal vesicles**
  - dull pains in the perineum, rectum and surrounding area
- **Testicles and epididymis**
  - primary or secondary testalgia

# Examination in urology

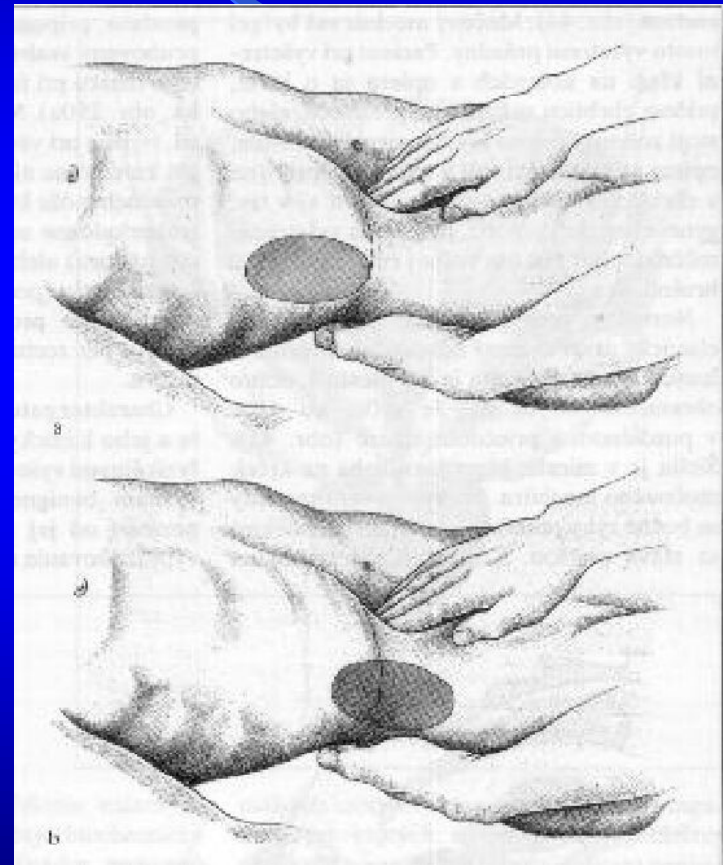
- Anamnesis
  - Physical exam
  - Laboratory examination (urine and blood)
  - Imaging methods
    - Ultrasonography
    - X-ray
    - Isotopes
  - Endoscopic methods
  - Examination of urinary tract function

# Physical examination in urology

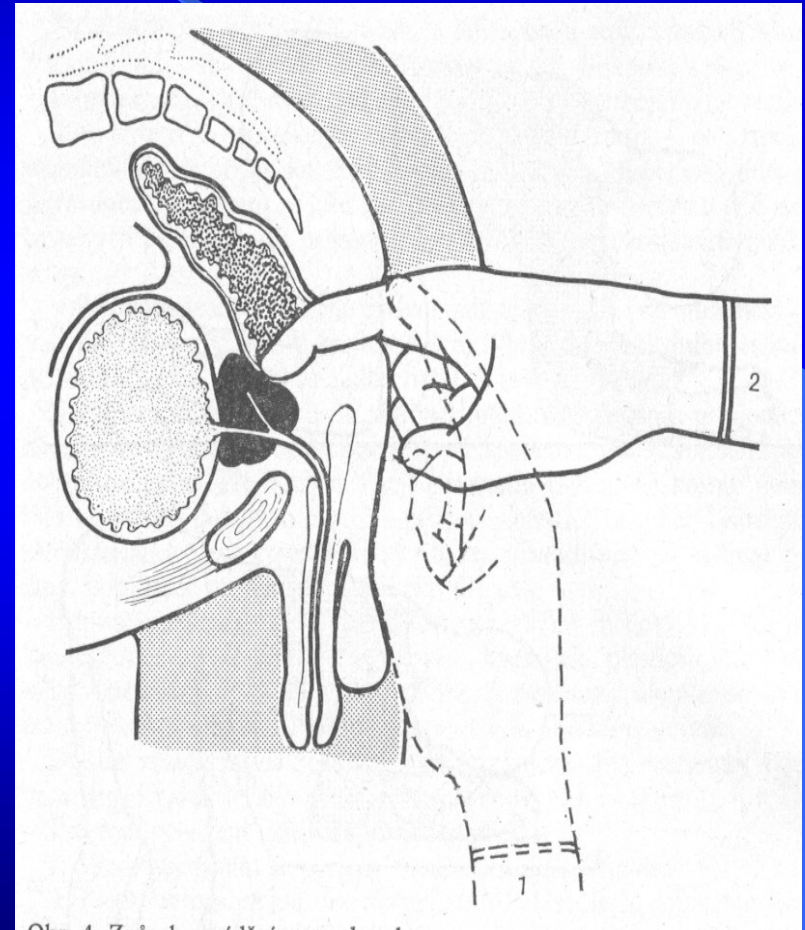
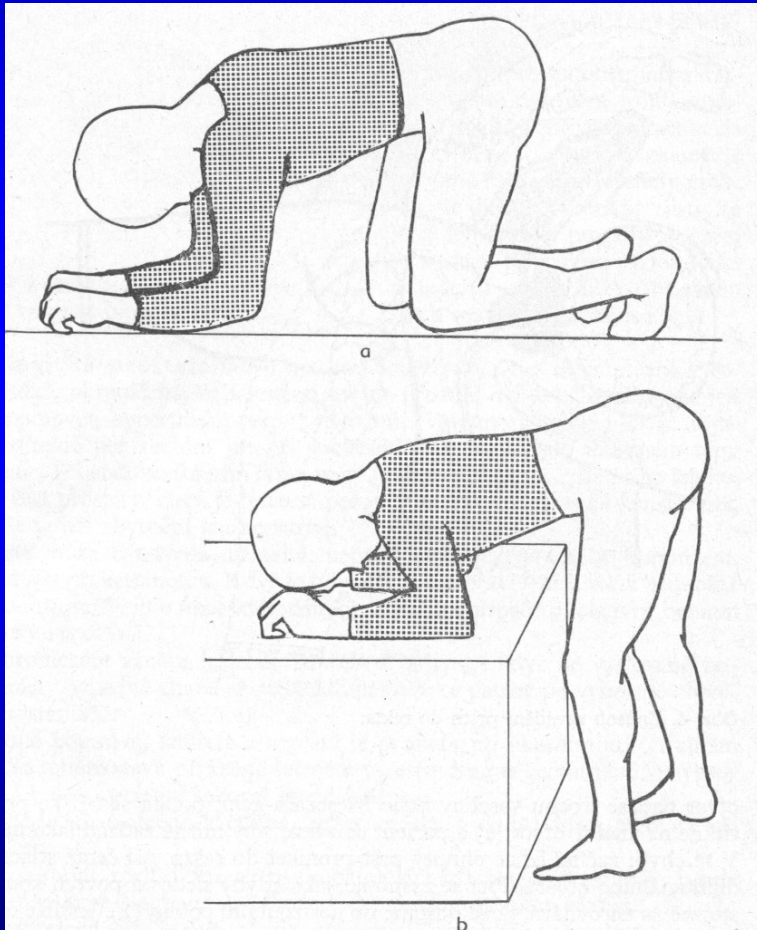
- Perspective – Aspects - View  
tumors, cysts, abdominal wall contractions
- Palpation  
bimanual, examination of the bladder,  
scrotum, penis, urethra  
examination per rectum
- Percussion
- Listening - aneurysm

# Palpation

- larger kidney tumors (bimanual palpation),
- movable kidney in ptosis, filled bladder,
- changes in penis and scrotum



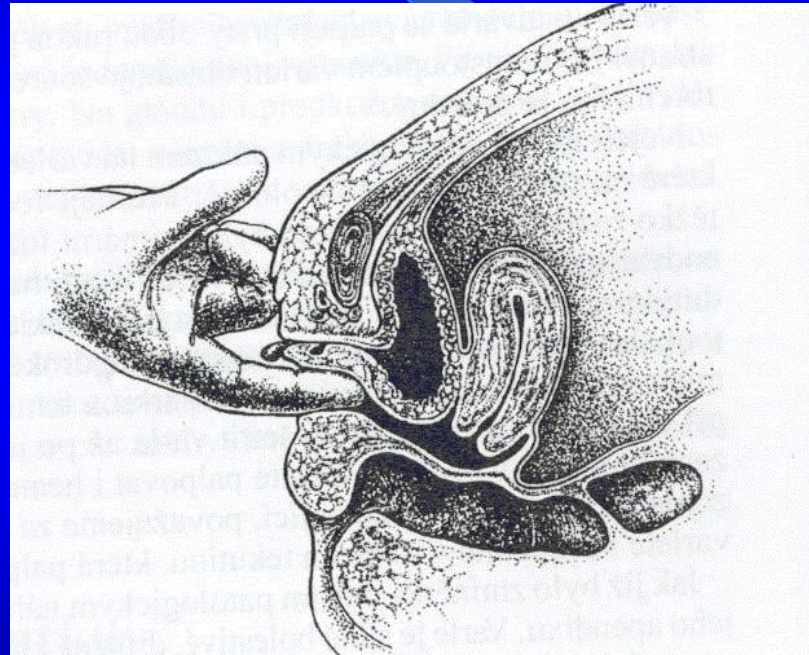
# Digital rectal examination



# Examination per vaginam

For women in indicated cases:

Ureterolithiasis  
Incontinence  
Urinary fistula  
Tumors



# percussion

- Tapping - (tapottement) with the little finger  
– hand - edge in the lumbar region  
examines the sensitivity of the kidney

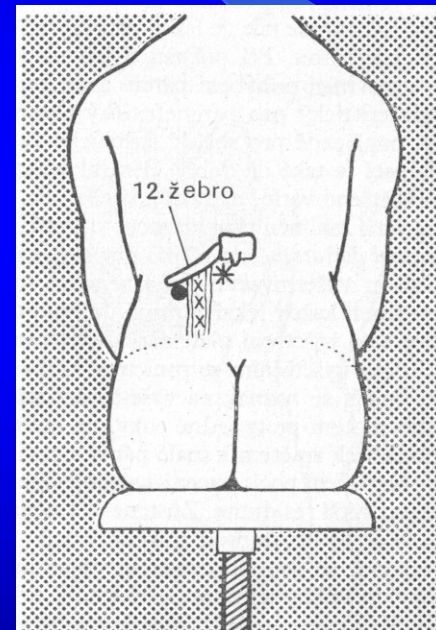
# hearing

- Listening is less used in urology, but it will help reveal aortic vortex in a dissecting aortic aneurysm, which may have similar symptomatology to renal colic.



# Differential diagnosis of pain (what is necessary to exclude ...)

- Ischiadic syndrome
- Herpes
- Biliary colic
- Abdominal colic
- Perinephric abscess
- Appendicitis
- Pankreatitis
- Gynecological diseases
- diseases

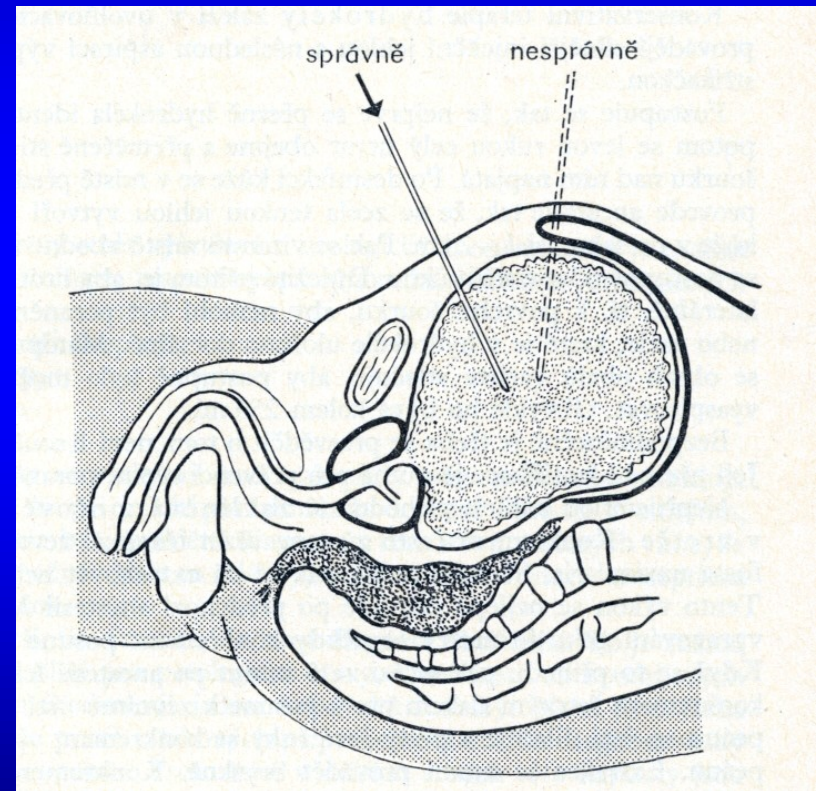


# Laboratory examination

- **Biochemical urine examination** (indicator papers)
  - pH, presence of protein, ketone bodies, bile pigments,
  - nitrites as indicators of bacterial infection
- Urinary sediment examination**
  - Qualitative
  - Quantitative (Hamburger or Addis collections)
- Blood tests** (urea, creatinine, uric acid, mineralogram, ABR, osmolarity)

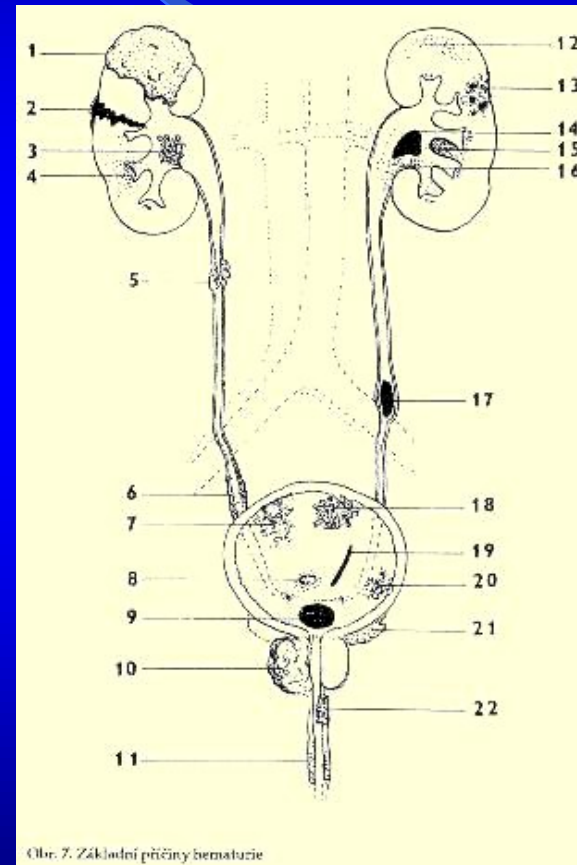
# Urine examination

- **Medium current**
  - First current
  - Final current
- Catheterized urine**  
(sterile collection in women)
- Suprapubic puncture**



# hematuria

- macroscopic, microscopic.
- initial, total and terminal
- painless, painful  
Hemoglobinuria  
Urethrorrhagie



# Examination of stones

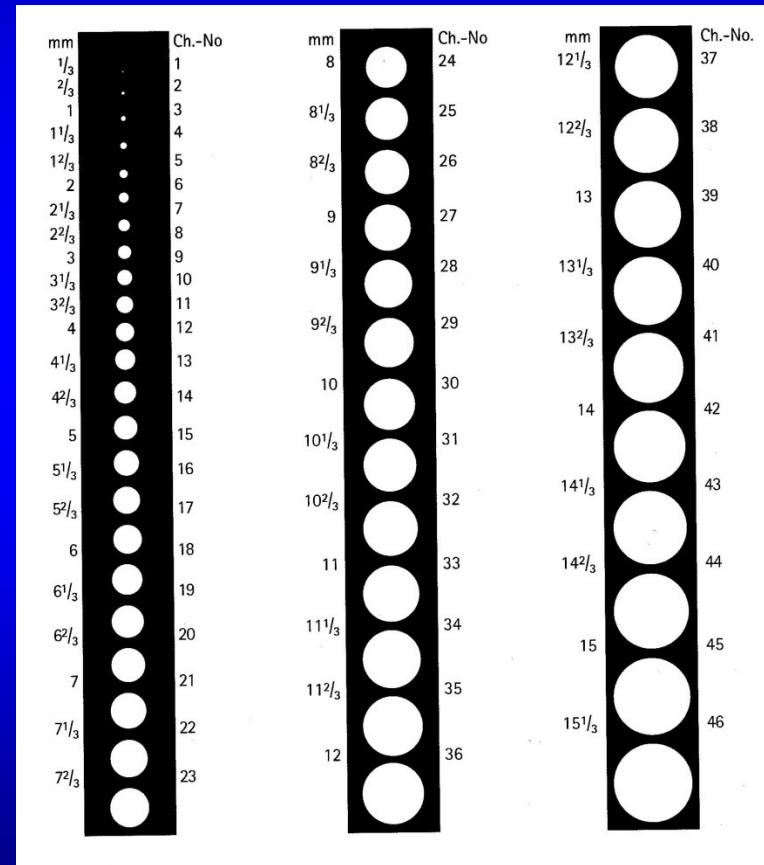
- Appearance
- Chemical examination
- Mineralographic examination
  - crystallography
  - Spectroscopy
  - X-ray diffraction
  - Polarization examination



# Urological aids and materials

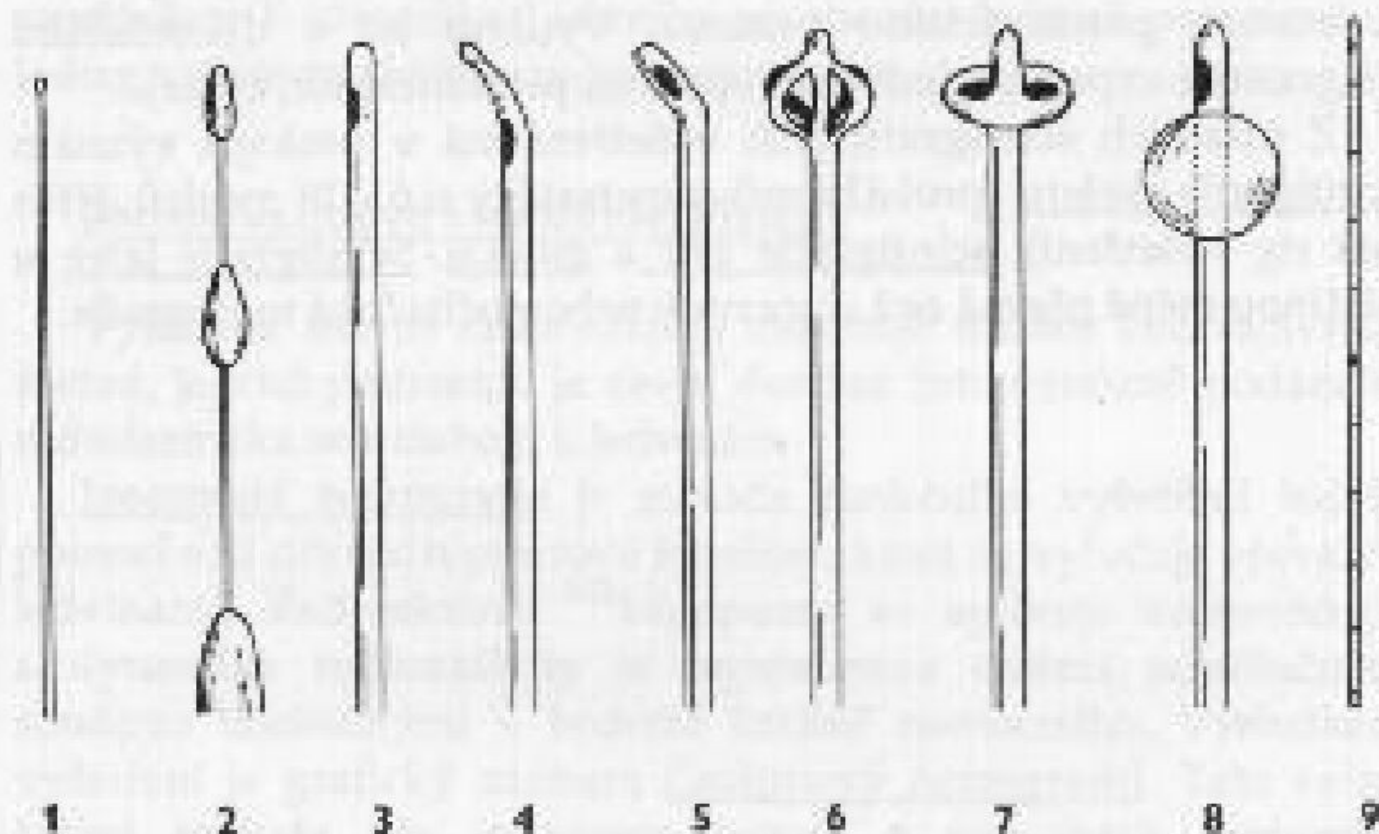
# Marking of catheters and catheters

- The circumference of the catheter is critical to clinical use
  - Charriere
  - French





# Types of catheter



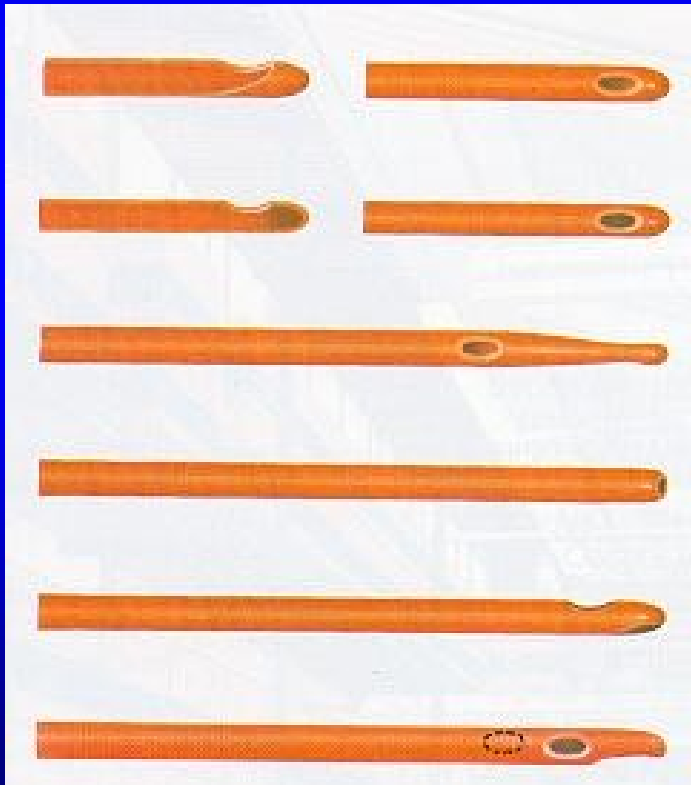
Obr. 13. Základní urologické cévky a sondy:

1 - filiformní sonda, 2 - bužie à boule, 3 - cévka Nelatonova, 4 - Tiemannova, 5 - Mercierova, 6 - Malecotova, 7 - Pezzerova, 8 - balónková, 9 - ureterální



# Disposable catheters

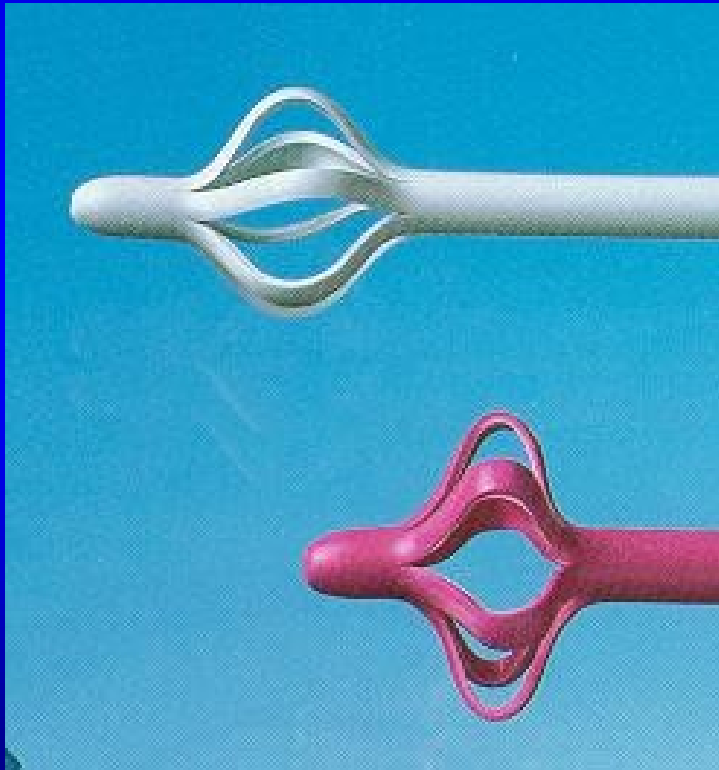
Nelaton



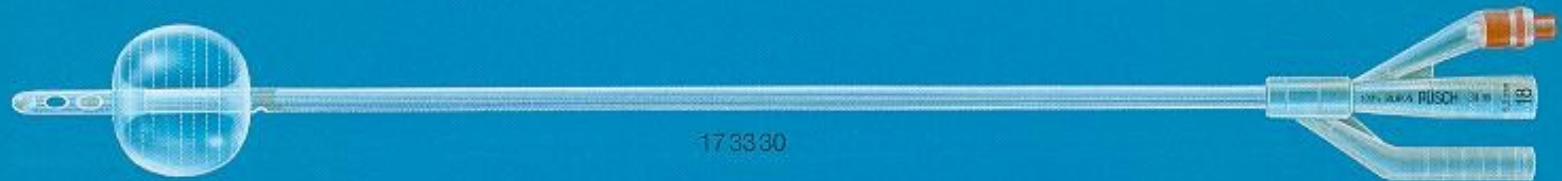
Thiemann



# Fixation of catheters



# Foley



ProfiCath:  
Querschnitt des Schaftes  
Cross-section of shaft  
Coupe de la tige

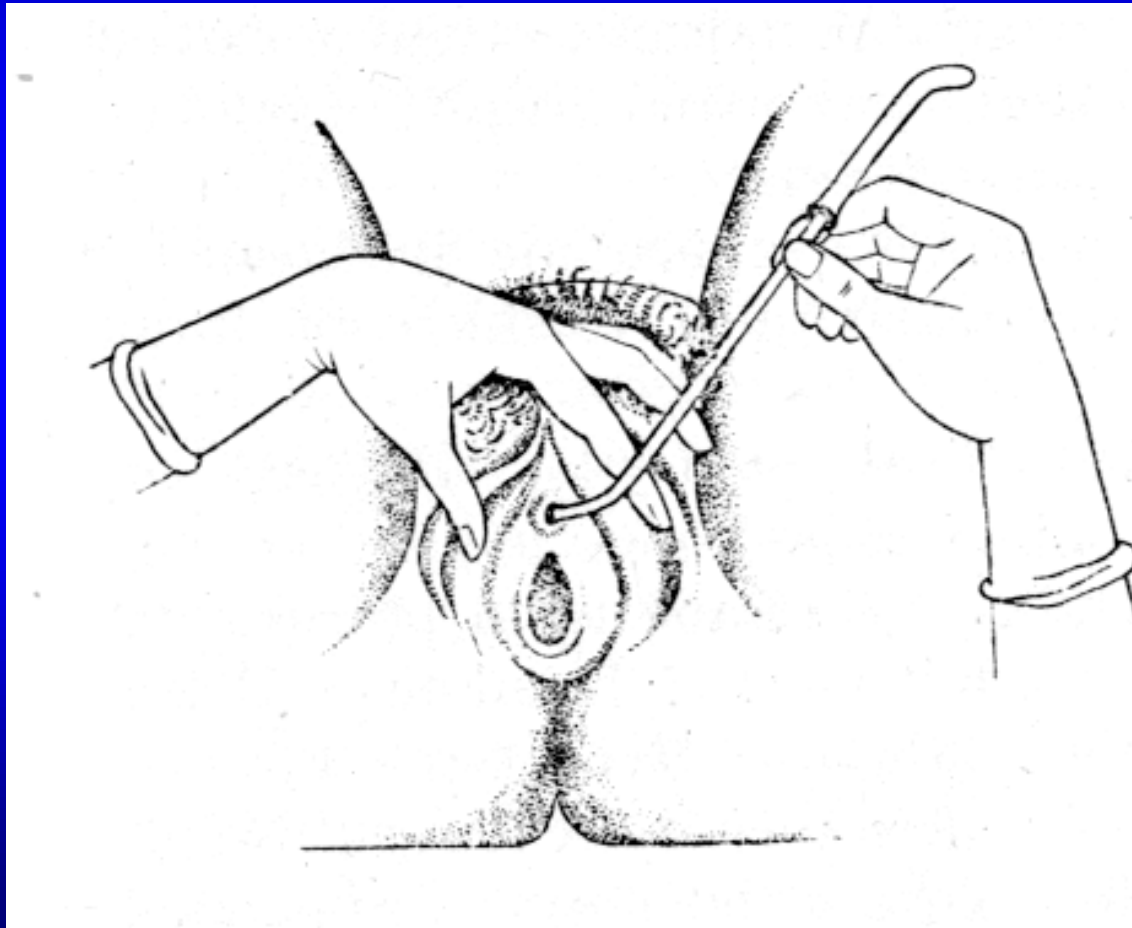


Zweilufig  
Two-way  
Simple courant

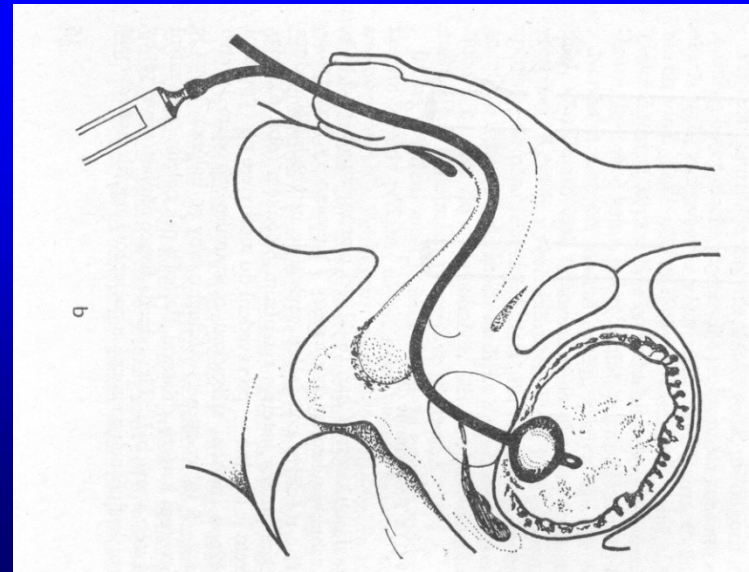
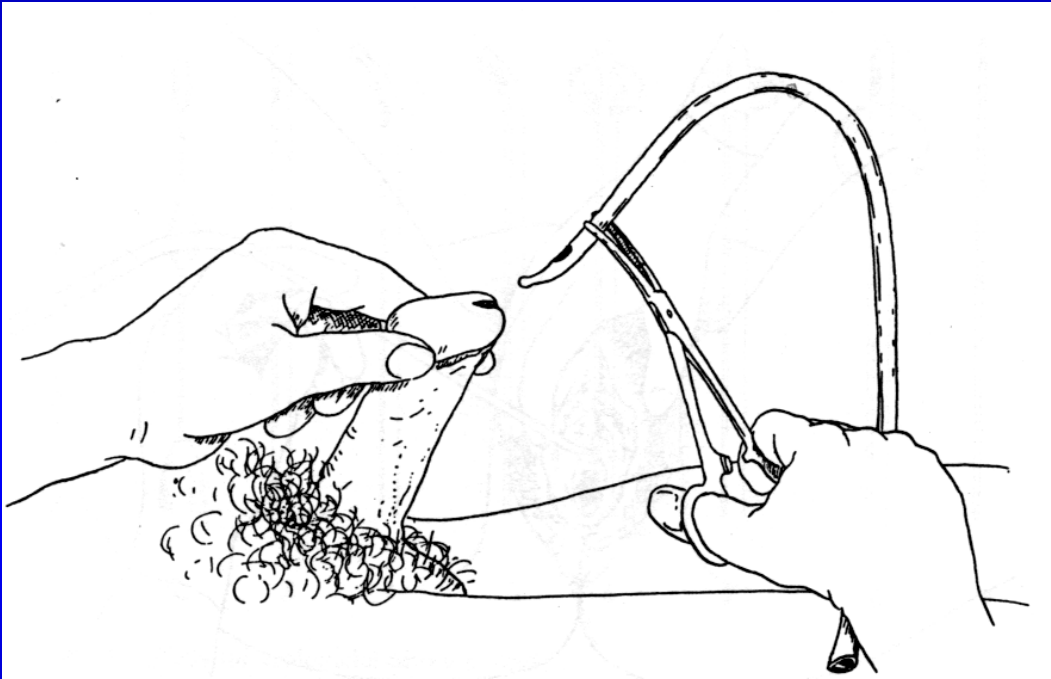


Dreilufig  
Three-way  
Double courant

# Woman catheterizing



# Man catheterizing



# Derivating performance

- Drainage through the lower urinary tract  
catheter  
double pigtail
- Nephrostomy  
puncture  
operating
- Operational derivative reconstruction



# The main problem of urology – drainage – impendimenta:

upper urinary tract:

stones

external ureter oppression

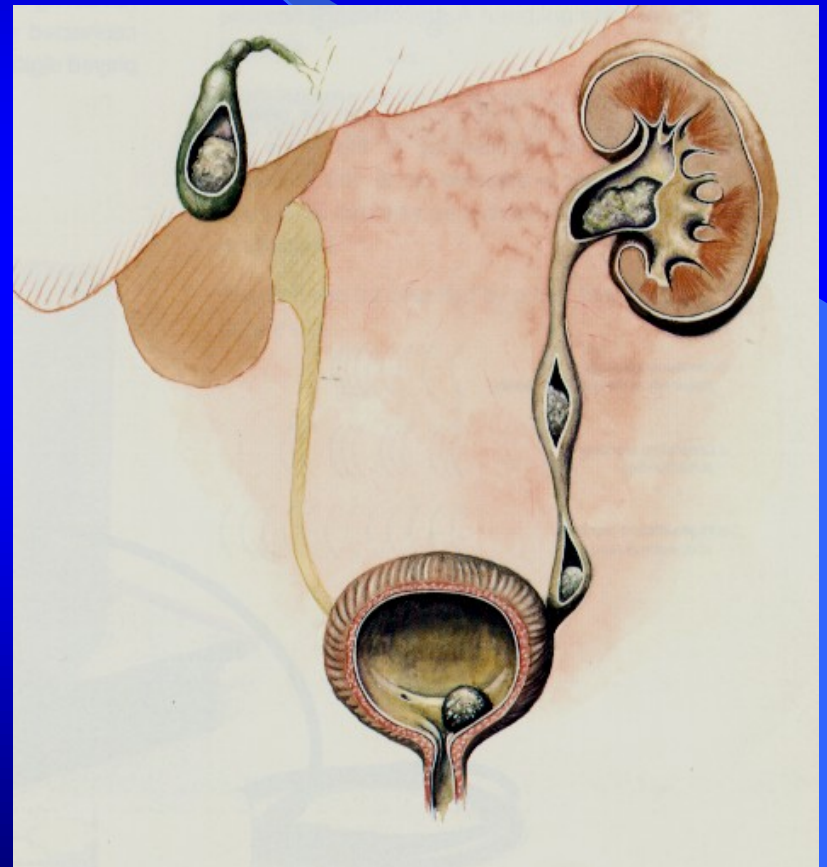
rarely tumors

lower urinary tract:

benign prostatic hypertrophy

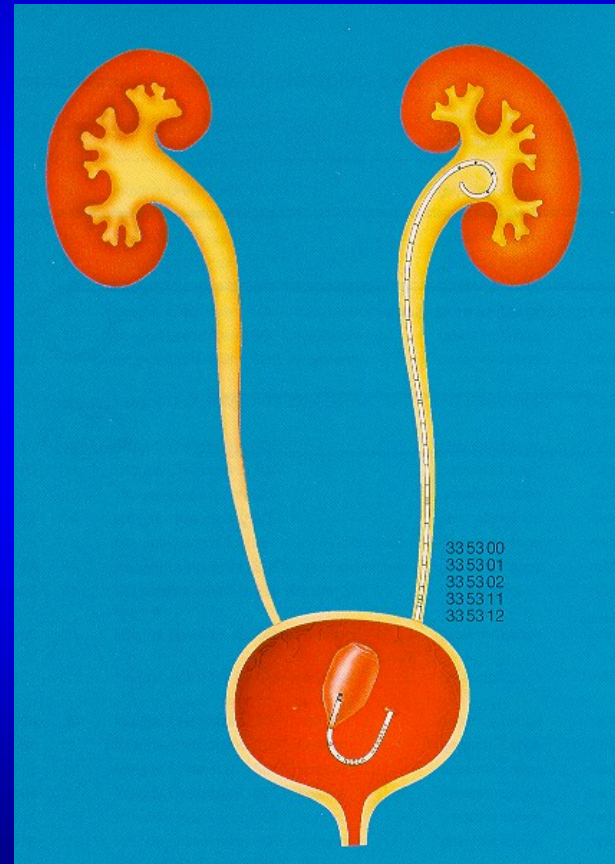
tumors

urinary stones



# Ureter drainage

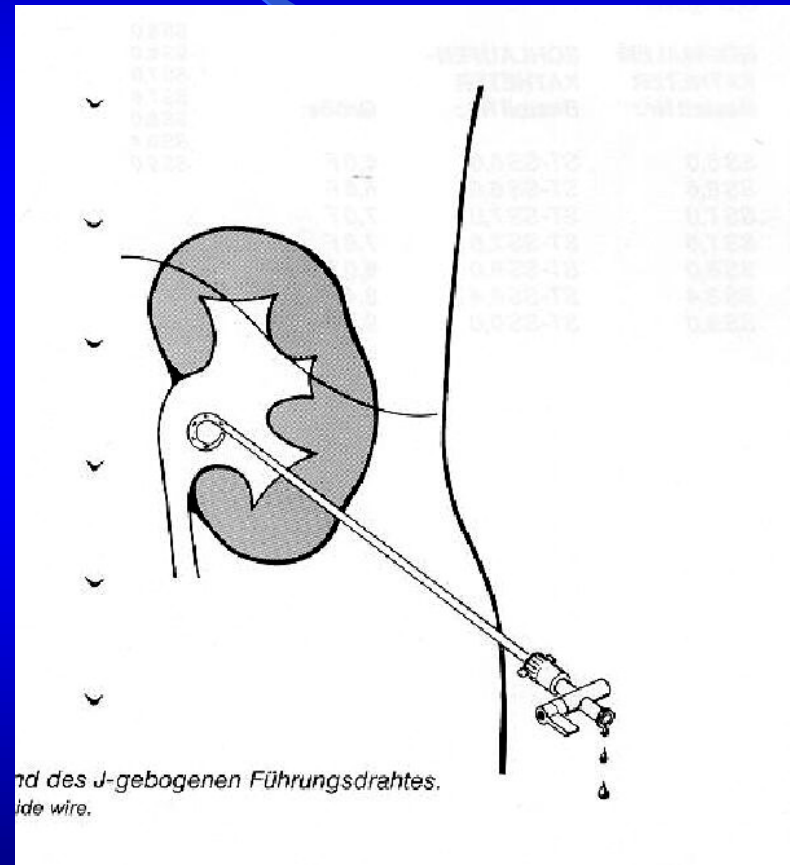
- ureteral catheter
- ureteral double (pigtail)
- nephrostomy
- stent



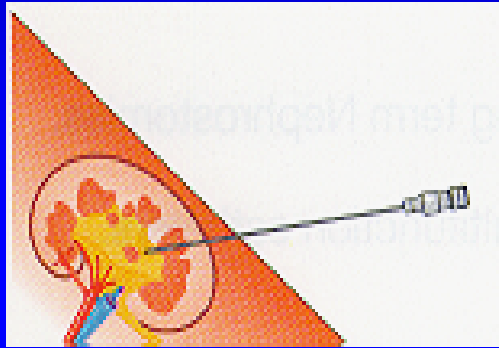


# Percutaneous nephrostomy

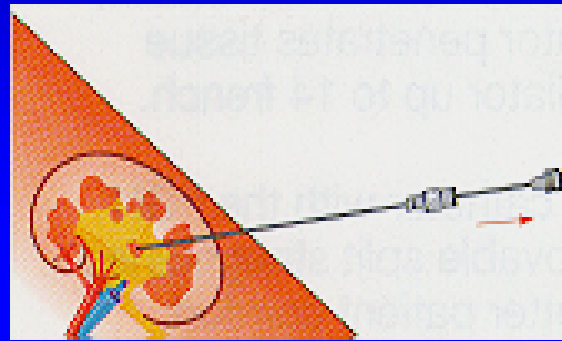
- Acute and long-term drainage
- Minimally invasive procedure
- Open road to kidney
- Good function control



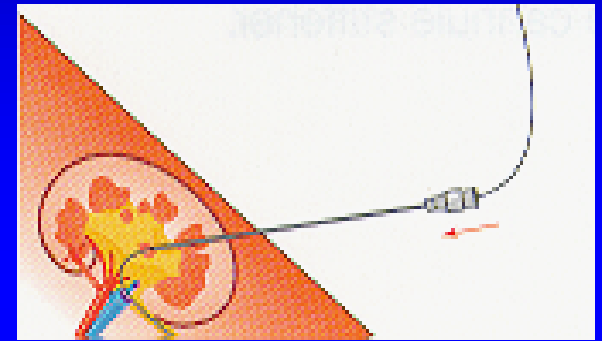
# Seldinger technique nephrostomy



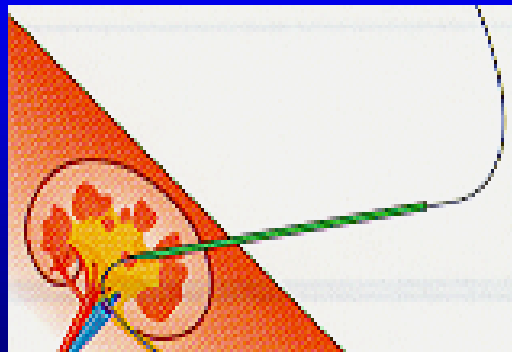
puncture



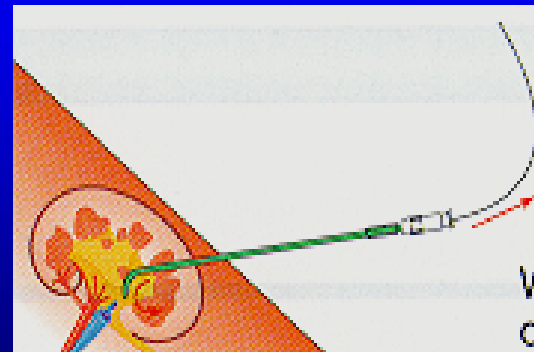
removal of mandrene



wire conductor

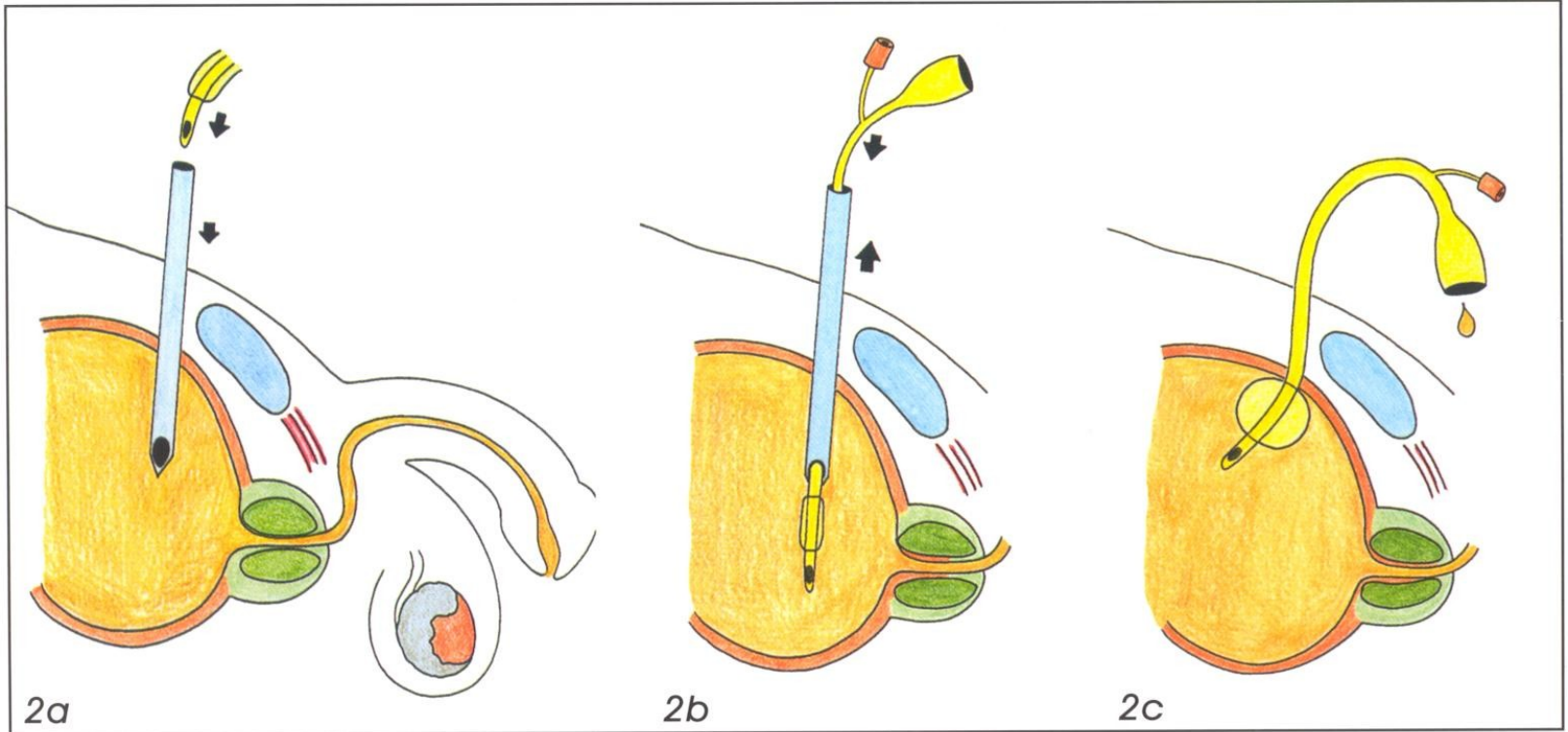


dilatation



nephrostomy

# Epicystostomy



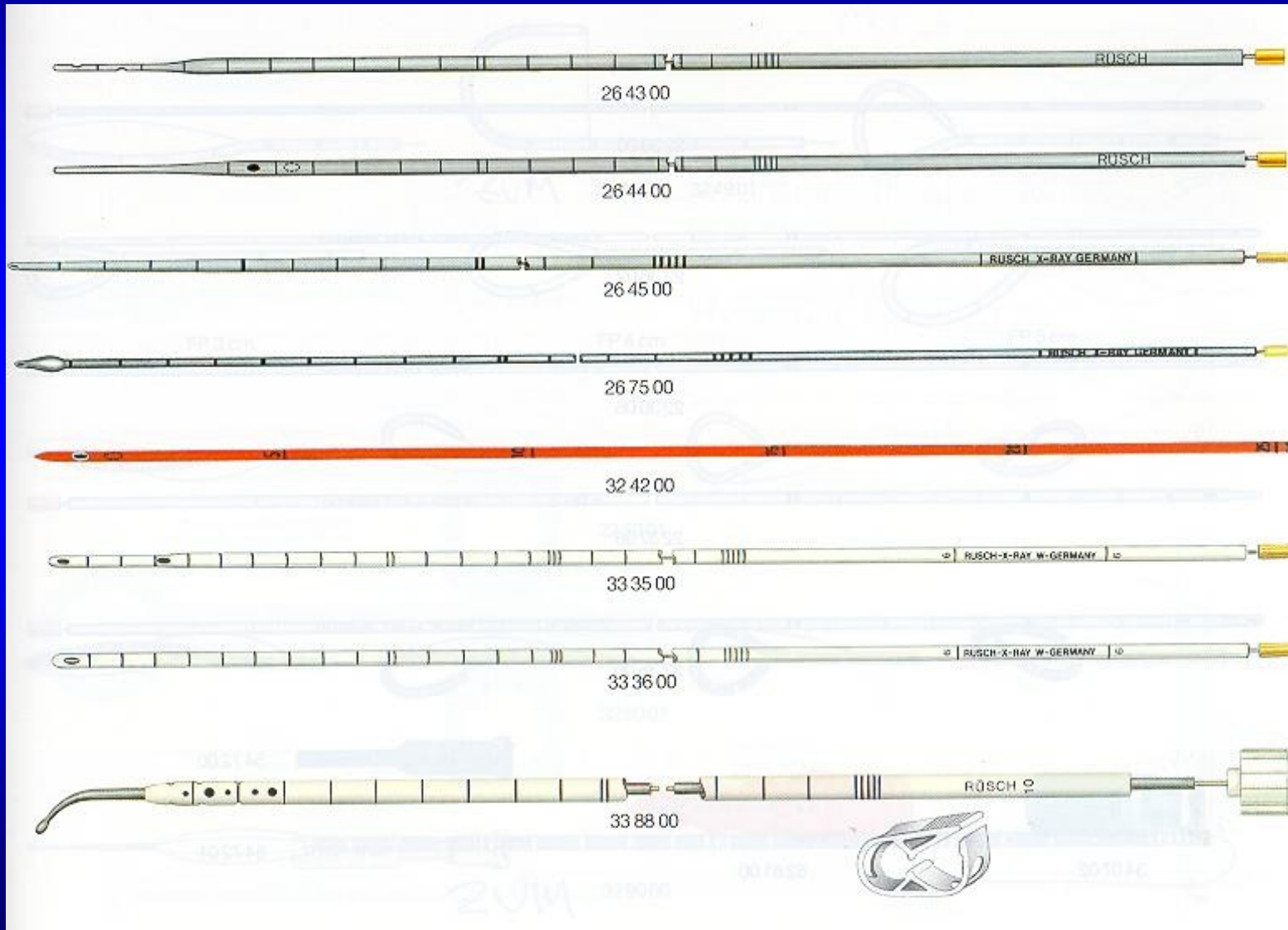
## 2. Punkční epicystostomie

2a Vpich punkční jehly

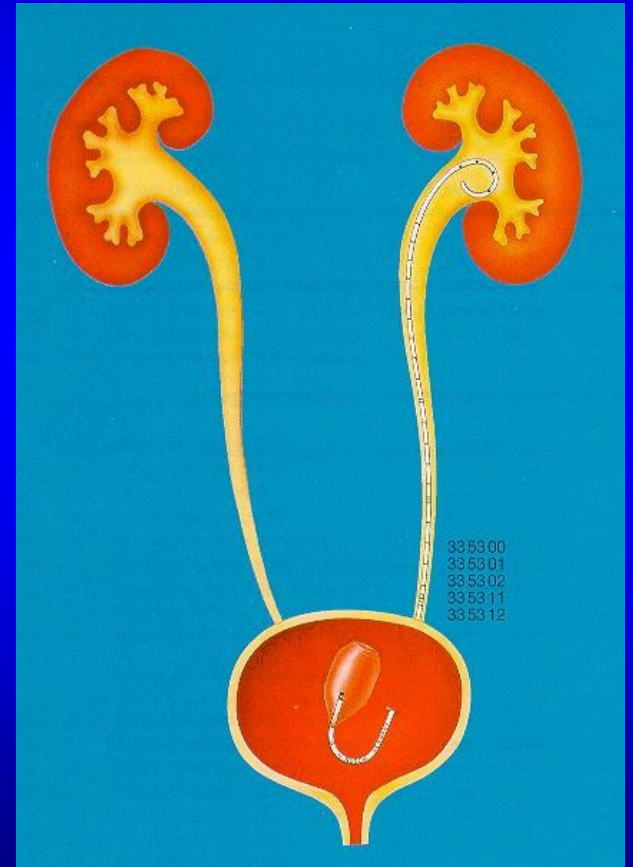
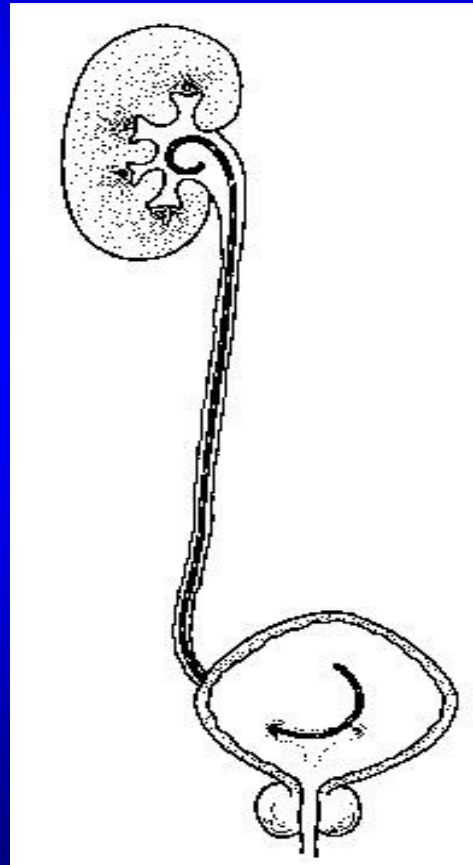
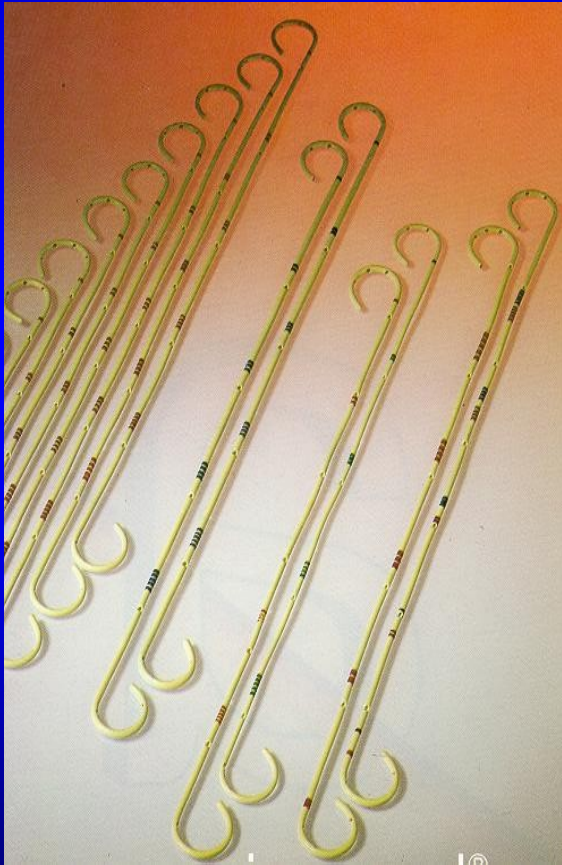
2b Zavedení katetru pláštěm jehly

2c Odstranění pláště jehly, fixace katetru

# Ureteral catheters

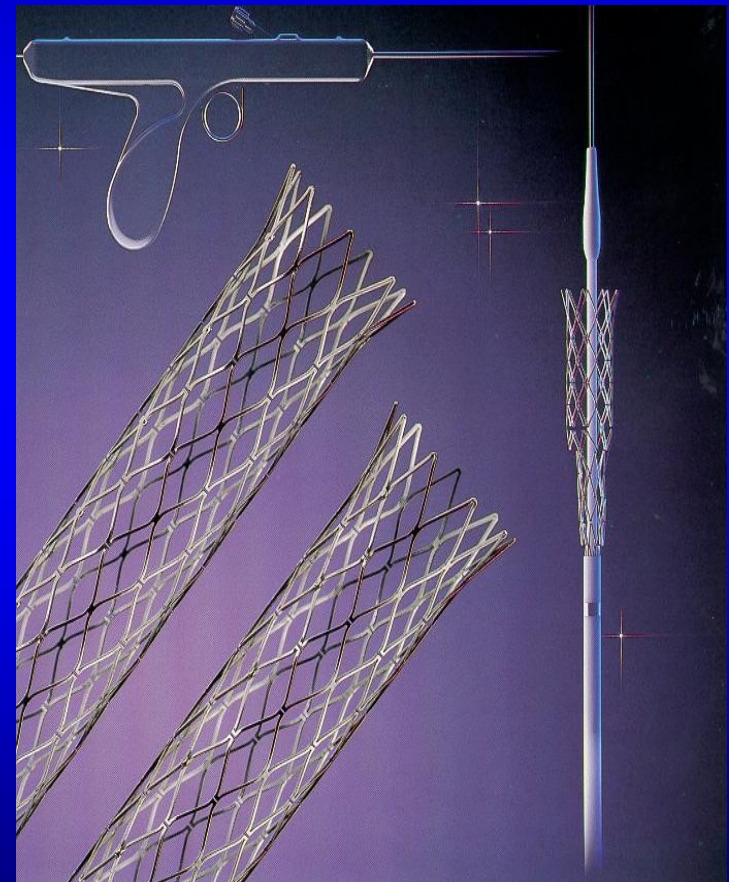
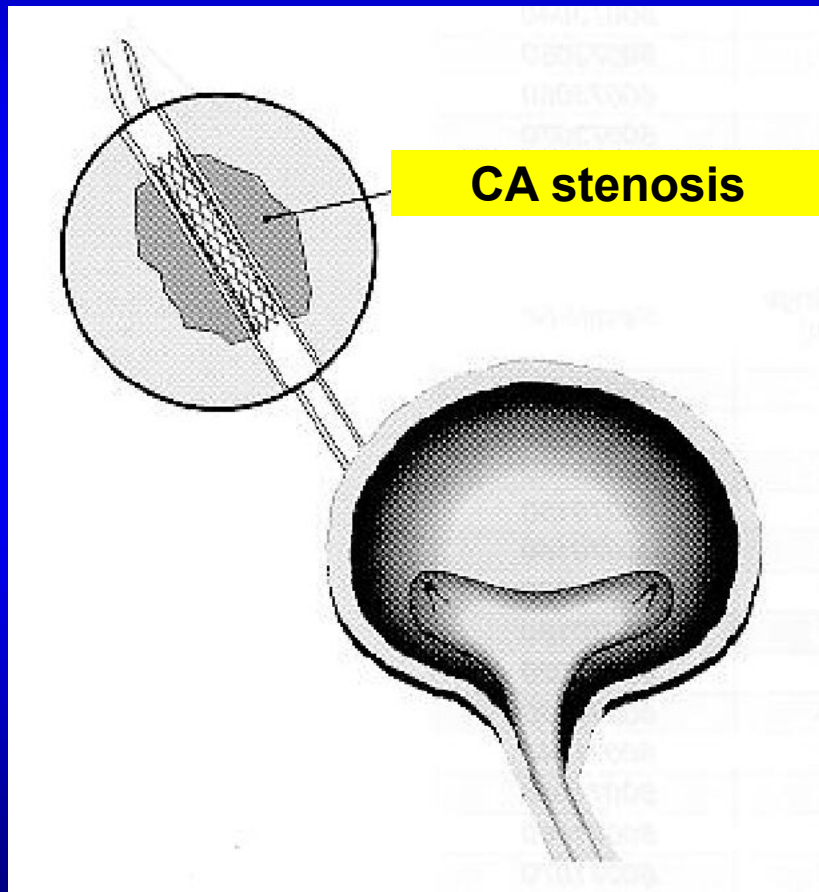


# „Double pigtail“





# Wall stent



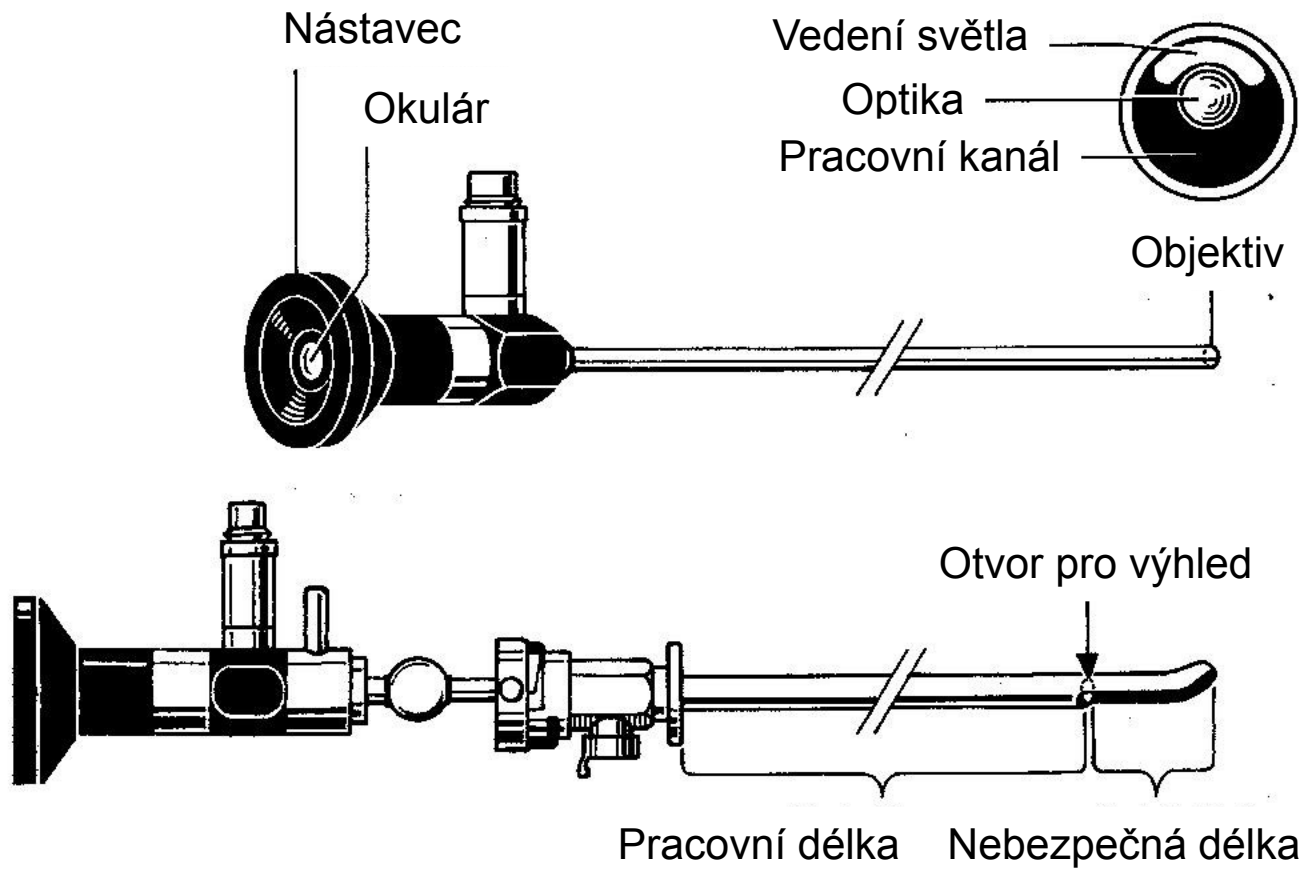
# Endoscopy in urology

# Endoscopes in urology

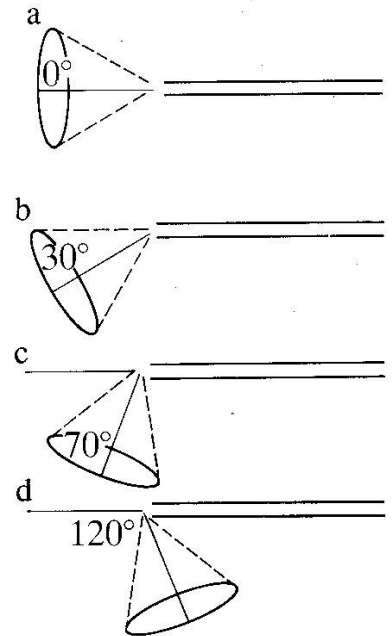
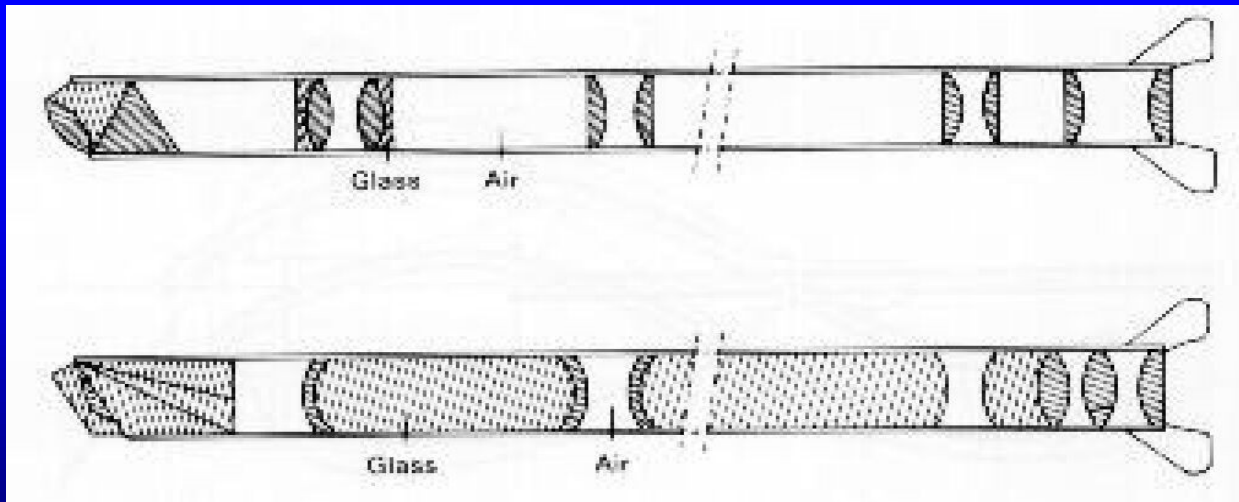
- Cystoscope
- Uretroscope
- Ureterorenoscope
- Nephroscope
- Pyeloscope
- Retroperitoneoscope (laparoscope)
- Endoscope for examination of cavum serosum scroti



# Cystoscopy

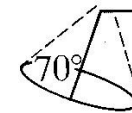


# Optics



**Fig. 1.28** Telescope views, straight and offset.

Standard field



Wide field



**Fig. 1.29** Telescope fields, wide or narrow.

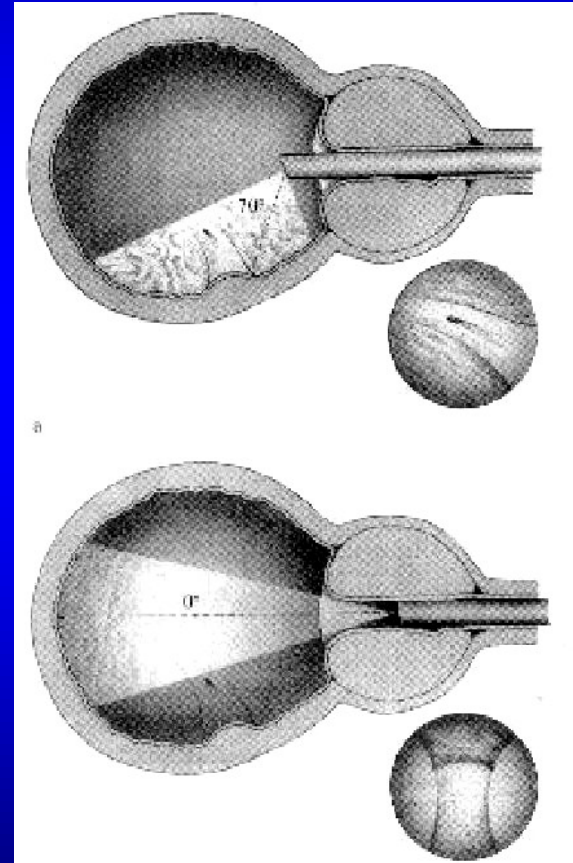
# Cystoscopy and ureteroscopy

## ➤ Cystoscopy

- optics tilt angle  $70^\circ$
- to examine the bladder

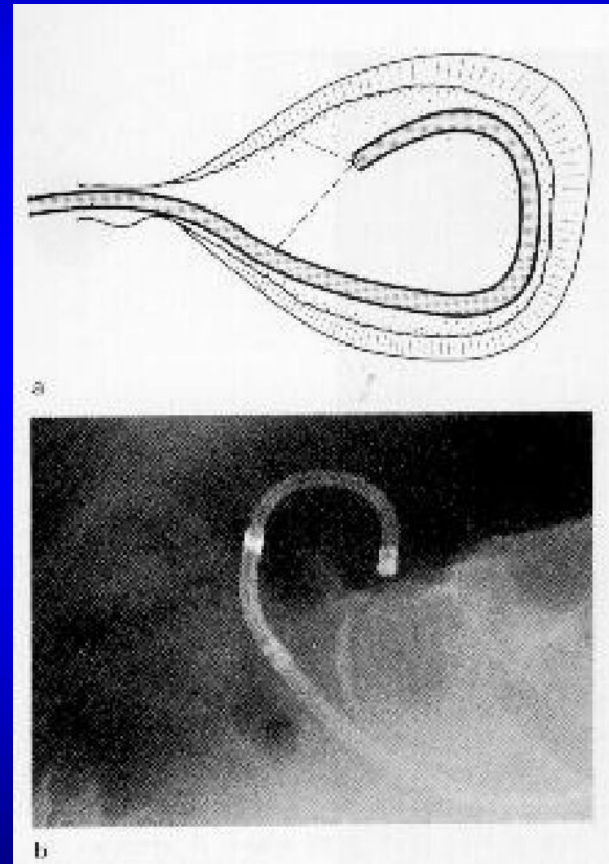
## ➤ Panendoscopy

- optics tilt angle  $0^\circ$
- for progressive examination of the urethra and ureter



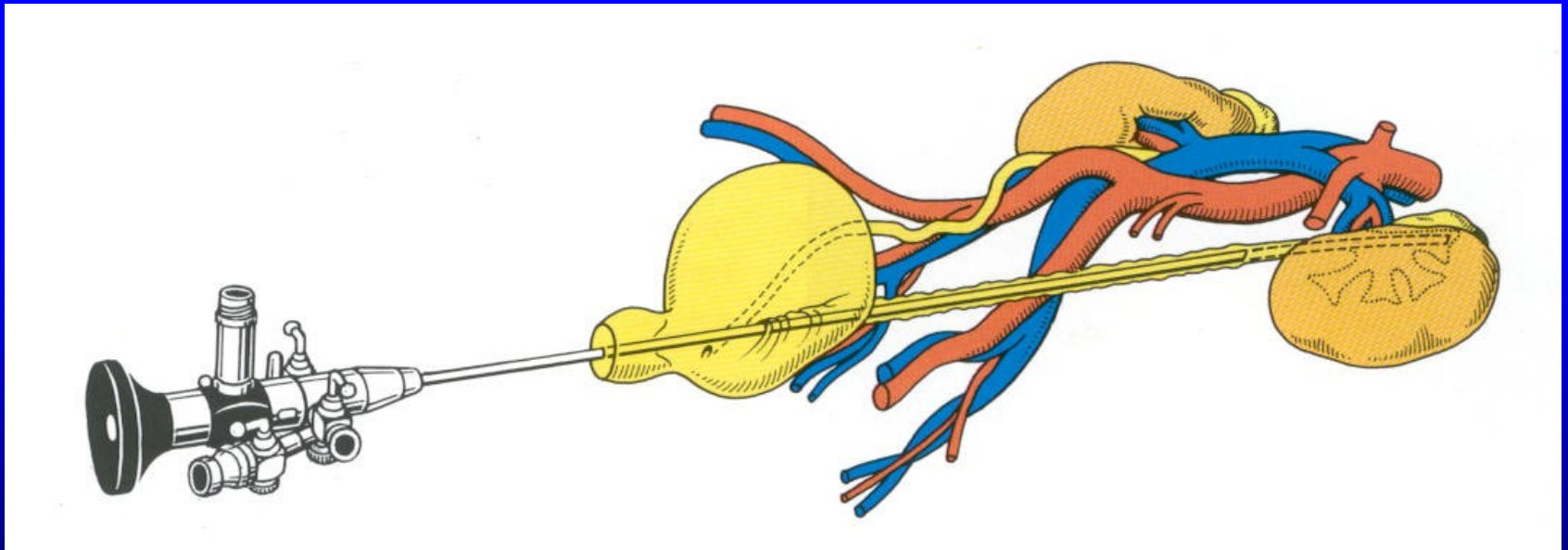
# Flexible tools

- **Cystoscope**
  - thin tool
  - well flexible
  - without operating channel
  - worse orientation about location
- **Ureterorenoscope**
  - for diagnostics



# Ureterorenoscopy

- Access via urethra and bladder



# Cystoscopy

- Right ureteral orifice



# Cystoscopy

- Left ureteral orifice





# Cystoscopy

- Bladder papilloma



# Cystoscopy

Cystolithiasis



# Cystoscopy

- Bladder tumor



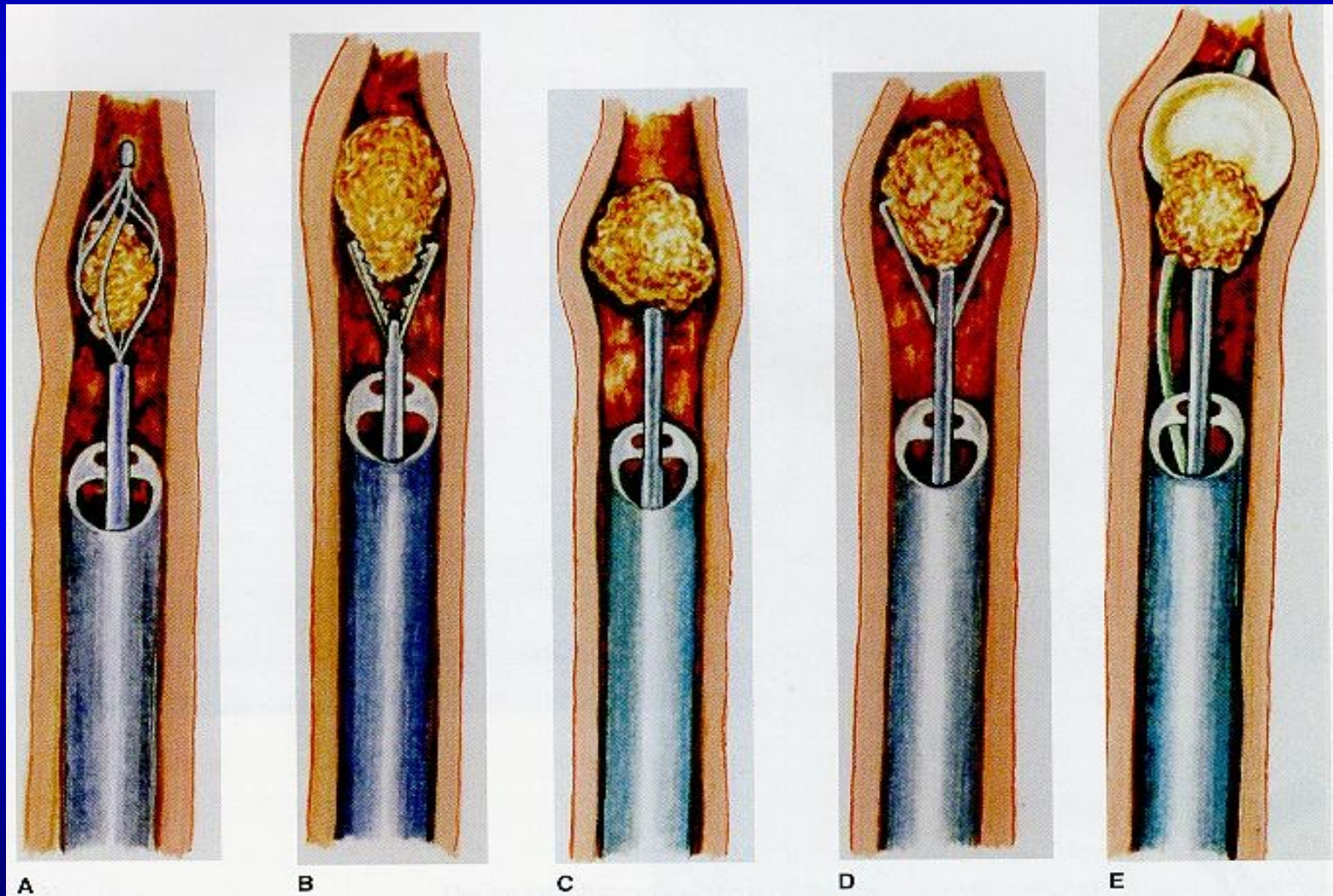
# Uretroscopy

- Stricture of urethra



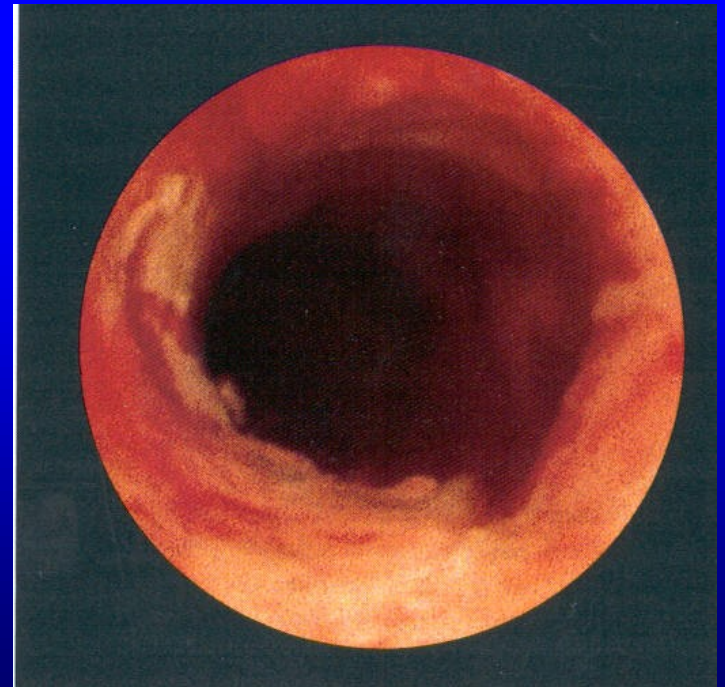
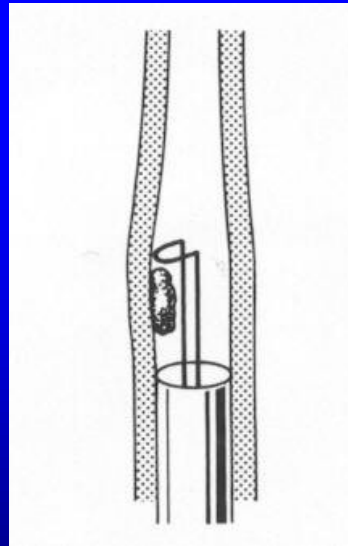
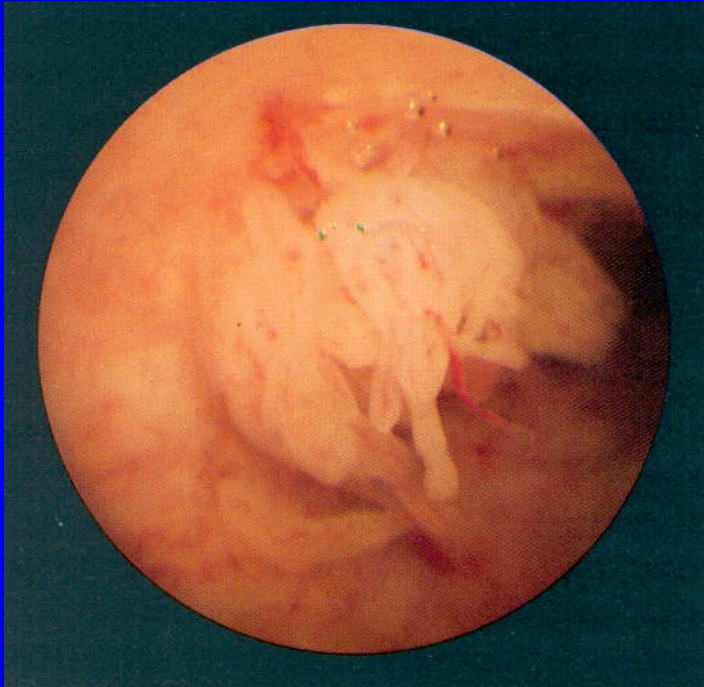
Bulbar stenosis.

# Ureterolithiasis





# Ureteral tumor



# Ureteral catheter





# Urgent procedures in urology

# Characteristics

- Often emerged from full health
- Serious symptoms altering the patient's condition
- Need urgent solution
- Often hospitalization

# Symptoms

- Pain
  - Abdominal symptoms
  - Elevated temperature
  - Bladder hematuria and tamponade
  - Urinary retention and anuria
  - Septic syndrome

# Renal colic

- upper urinary tract obstruction syndrome
  - concrement
  - coagulum (tumor!)
  - Necrotic tissue
  - Caseous matter
  - Edema in inflammation or allergy

# Renal colic

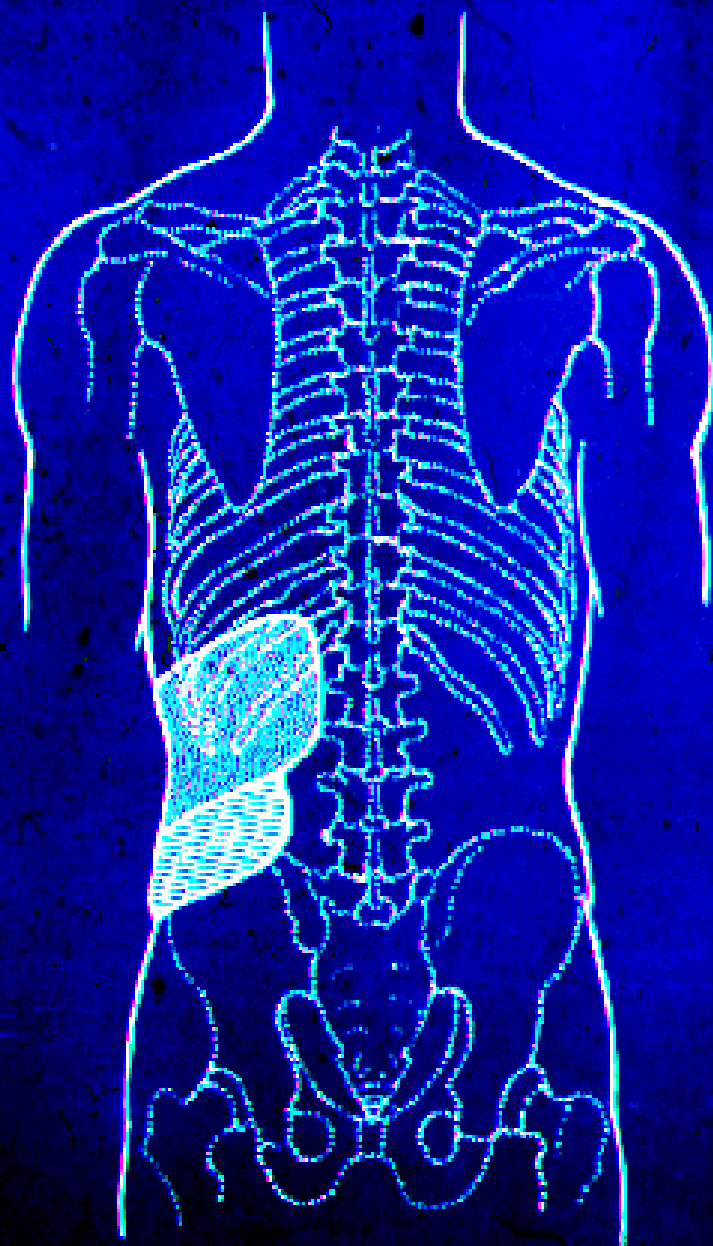
## Symptoms

Pain

Motor restlessness

Nausea, vomiting, intestinal paresis

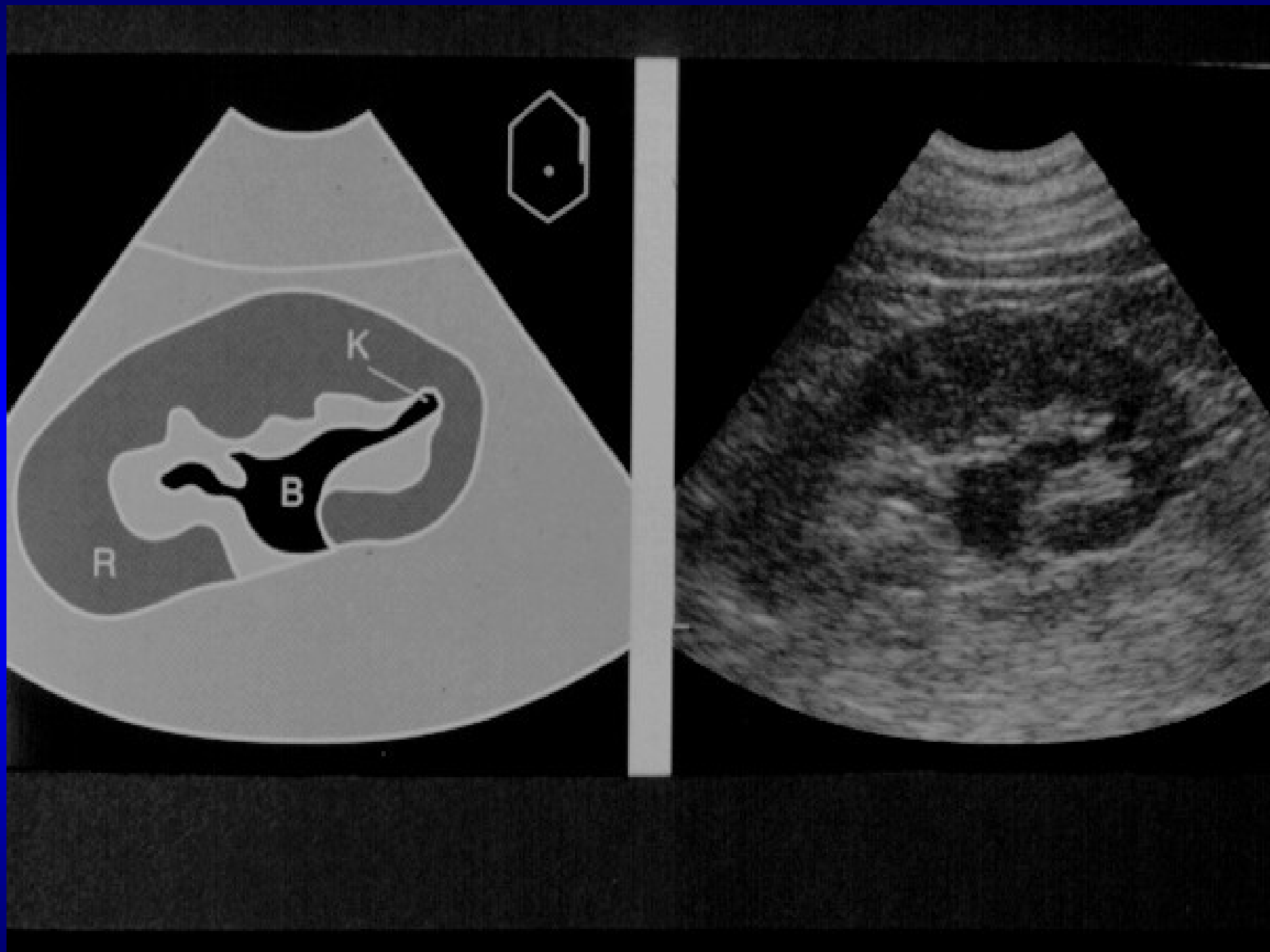
Polypnoea and bradycardia (vagus)



# Renal colic

- Diagnosis
  - Finding on stomach
  - Basic laboratory
  - Imaging examination
    - ultrasonography
    - X-ray methods





# Renal colic

- Therapy
  - Spasmolytics
  - Spazmoanalgetika
  - Antiedematics
  - Ganglioplegics
  - Anodynas

# Renal colic

- **Complications** are the result of long-term obstruction

Inflammatory complications - acute pyelonephritis to urosepsis - chronic pyelonephritis with complications

Hydronephrotic kidney atrophy

(in long-term obstruction without infection)

# Acute retention

It is due to infravesical obstruction

- benign prostatic hyperplasia
- prostate cancer
- stricture and urethral valves
- uretrolithiasis

# Acute retention

- Has a positive medical history (dysuria, trauma, uretra discharge)
- Crowded bladder with lower back pain

# Acute retention

- The distended bladder can be:
  - hammer out
  - feel
  - see
  - found sonographically
  - find out by emptying the catheter

# Acute retention

## Therapy

Bladder catheterization:

a / single

b) establishing a permanent catheter

Suprapubic evacuation puncture urine. bladder

Puncture epicystostomy

Attention!

a / use a soft balloon catheter

b / “Drop out twice” (e-vacuo bleeding, not all at once)



# Oliguria and anuria

- **Reduction of diuresis:**

oliguria below 400 ml / d (20 ml / h)

anuria below 100 ml / d (5 ml / hour)

**Functional oliguria (benign)** = dehydration in

1. well-functioning kidneys
2. with free upper urinary tract (HMC) = responds well to volumotherapy!

# Urosepsis

- the infectious agent primarily affects the Urogenital organ
- the disability first alters its function
- sepsis is then a set of disorders and organ reactions to them, affecting even the tissues intact by the infection

# Urosepsis - causes by frequency

- pyelonephritis, pyonephrosis
- Epididymitis
- acute prostatitis
- urethral (catheter) fever
- male genital gangrene

# Septic syndrome

- presence of an inflammatory deposit
- septic type of temperature
- tachycardia above 90 pulses / min
- tachypnoe above 20 breaths / min
- Oliguria
- anxiety, agitation, confusion, sopor

# Diagnosis of urosepsis

- Careful clinical examination of UGT organs
- Imaging methods (USG, VU, CT) clarify:
  - conditions of drainage. upper urinary tract
  - inflammatory infiltration, colitis or retention in the kidney, retroperitoneum and genital area
  - distinguishes between surgical, gynecological and internal sepsis

# Urosepsis – th

monitoring of CVT (central vein cannulation) and hourly diuresis (permanent catheter)

sanation of the infectious deposit (urine drainage, abscess emptying, nephrectomy, semi-castration)

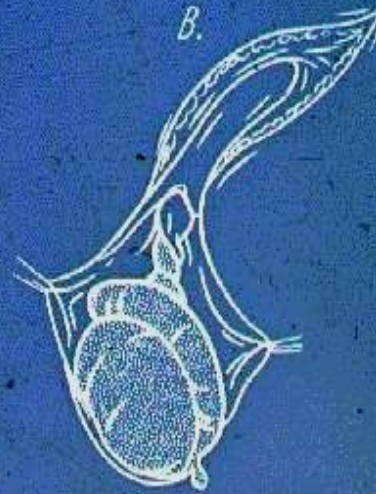
antibacterial treatment

general therapy (infusion, plasmaexpanders, corticoids, acidosis correction, tenzamine in renal dose)



# Testicle torsion

- actually the torsion of sperm funicular
- sudden onset in children and adolescents
- shocking pain, nausea and vomiting
- without signs of inflammation including urine
- the testicle is painful, its elevation does not bring relief
- sonographically hydrocele, doppler without blood supply.





# Testicular torsion - treatment

- surgical treatment within 4-6 hours  
risk of necrosis: revise if in doubt  
Vital testis derotate, necrotic remove  
fix even the second testicle

# Epididymitis

- ductogenic inflammation of the epididymis
- subacute onset of swelling and pain
- local and general signs of inflammation, especially urine. honor
- pyuria and leukocytosis
- testicular elevation reduces pain
- sonographically affected epididymis

# Epididymitis - th

- wide-spectrum ATB
- corticoids to facilitate their penetration
- antipyretics, antiphlogistics
- scrotal elevation + lining
- in the case of failure surgical therapy

# Orchitis

- hematogenic origin (viruses, pneumococcus, brucella)
- or per continuitatem from epididymis
- local and general signs of inflammation
- urine without finding
- elevation relieves pain
- sonographically affected testis

# Orchitis - th

- broad spectrum antibacterial therapy
- antiphlogistics and antipyretics
- calm with elevation scratch
- only in granulomatous chronic forms - semicastration

# Paraphimosis - characteristics

- supposes the existence of phimosis
- arises after dragging the foreskin behind the glans
- glans swell lymphatic and venous stasis
- the strangulation strip may necrotize

# Paraphimosis th

- penile anesthesia (mucosal, infiltration)
- "Emptying the gland" by compression
- only then the reduction  
discision of strangulation line
- or circumcision