

Workshop : Managing Urinary Stones and BPH

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How common are they?

- ▶ lifetime risk 15% men, 6% women
- ▶ 105 new stones / 100,000
- ▶ peak age incidence 30–50
- ▶ males 2.3:1

How common are they?

- ▶ 1 / 3 renal – often haematuria
- ▶ 2 / 3 ureteric – usually pain
- ▶ 1 / 3 have previously had a stone
- ▶ 20% have a family history

Presentation

- ▶ Loin or loin to groin pain
- ▶ Typically colicky, patient cannot get comfortable
- ▶ beware – older patient – AAA
 - distal stones – irritative without pain

Investigation

- ▶ MSU
 - microhaematuria 10% no RBC's
- ▶ Blood
 - Ca Hyperparathyroidism
 - Urate Uric acid stones
Nidus for Ca stones
 - Creatinine

Ultrasound

- ▶ Accuracy around 80%
- ▶ Ureteric stones can be missed
- ▶ Best for follow-up or recurrent stone formers
- ▶ Hydronephrosis infers a PUJ/ureteric stone
- ▶ Ureteric jet

CT Urogram (C-)

- ▶ accuracy around 99%
- ▶ quick
- ▶ best for ureteric stones
- ▶ size and position of stones

CT Urogram (C-)

- ▶ associated pathology
- ▶ low dose protocols – accuracy vs dose
- ▶ other MRI – stones not visible

Natural History

- ▶ ureteric stones
 - 80–90% <5mm pass
 - usually 1–3 weeks
 - remove at 6 weeks
- ▶ renal stones
 - unlikely to pass

Management

- ▶ Refer if
 - ureteric stones 6mm or larger
 - ongoing pain
 - renal impairment
 - infection
 - pregnant
 - renal stones (outpatient)

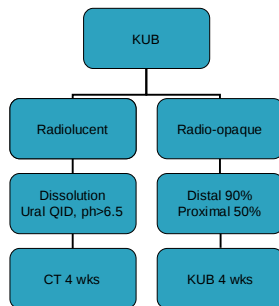
Management

- ▶ Fluid intake
- ▶ Medication
 - if creatinine normal
 - Diclofenac 75 mg
 - ureteric smooth muscle relaxation
 - alpha blockers
 - ca antagonists

Expulsive Therapy–Alpha blockers

- ▶ chance of passing
 - Doxazosin 38%–70%
 - Tamsulosin 57%–88%
- ▶ time to passing
 - Tamsulosin 7vs12 days
- ▶ analgesia
 - 0.14 vs 2.78 vials
- ▶ which alpha blocker?

Follow-up



Ureteric stents

- ▶ protect kidney, prevent obstruction
- ▶ stent pain an issue
- ▶ symptoms improve with
 - alpha blockers
 - anticholinergics
- ▶ remove if no improvement

What are the options if medical management fails?

- ▶ Mid and lower ureter

rigid ureteroscopy



What are the options if medical management fails?

- ▶ Upper Ureter and Kidney

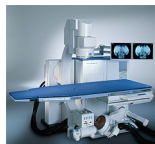
Flexible Ureteroscopy

Lithotripsy



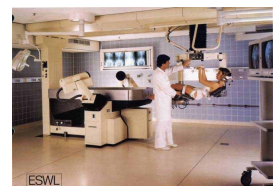
Extracorporeal Shock Wave Lithotripsy (ESWL)

- ▶ Acoustic waves
- ▶ Dornier aircraft manufacturer
- ▶ Prototype 1980, first HM3 1984

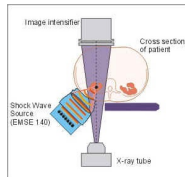


The original Lithotripter

- ▶ HM3 American trials
 - solitary renal calculi
 - < 1 cm
 - success 77–90 %

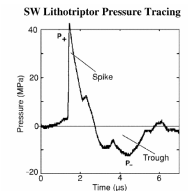


Shock Wave Generation



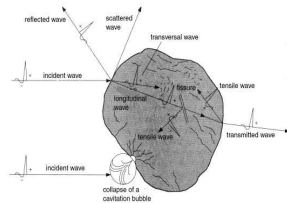
How does ESWL work?

- ▶ Dynamic fracture – compression wave
– tensile tail
- ▶ Erosion – cavitation



Cavitation

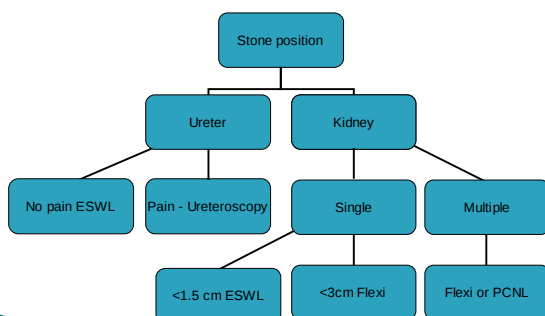
- ▶ Bubble cluster collapse
 - filled with vapour
 - powerful water jet
 - can pit metals



Surgical options

- ▶ ESWL – success 70 %, day stay
- ▶ Flexi – success 90–95%, 1 night stay
- ▶ PCNL – success 90–95%, 3–4 nights

Surgical options



Stone Prevention

- ▶ 50% develop another stone within 10 yrs
- ▶ Reduce to 20% with lifestyle/medication
- ▶ GP's ideally placed

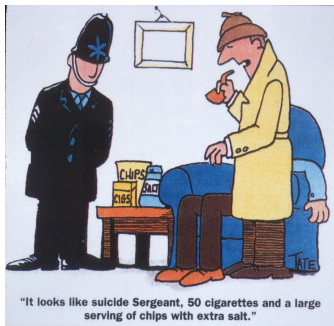
Why do stones form?

- ▶ **Solubility product:** concentration in pure solution at which crystallisation begins
- ▶ Stone inhibitors
- ▶ Stone promoters
- ▶ Temperature, pH

Fluid

- ▶ most common problem
- ▶ most important factor
- ▶ aim for clear urine or 2 litres output
- ▶ compliance an issue

Is diet relevant?



Dietary Changes

- ▶ calcium
 - intake inversely related to risk
 - 2+ servings per day
- ▶ oxalate
 - 15x more potent than calcium
 - nuts, spinach, chocolate, taro, rhubarb
- ▶ citrate
 - 1 lemon/day

Dietary Changes

- ▶ salt
 - increases calcium excretion
 - healthy heart advice
- ▶ protein
 - increased uric acid, oxalate
 - acid buffering in bone
 - increased calcium excretion
 - 100g / day

Medication

- ▶ Allopurinol
 - hyperuricaemia
 - hyperuricosuria
- ▶ Thiazides
 - hypercalciuria

Recurrent stone formers

- ▶ 24 hour urines give more detail about risks
 - commonest findings
 - low fluid intake
 - high calcium excretion
- ▶ refer to a specialist

Recurrent stone formers

- ▶ 24 hour urines
 - normal diet and fluid intake
 - results can vary – 6 is best
 - need two as a compromise

Recurrent stone formers

- ▶ 24 hour urines
 - ACID Ca, PO₄, Citrate, Oxalate
 - Non-acid uric acid , sodium

Stone Prevention Summary

- ▶ 50% chance of more at 10 years
- ▶ urine output over 2 L per day (clear urine)
- ▶ moderate calcium intake
- ▶ reduced oxalate, meat, sodium in diet
- ▶ citric acid – juice of 1 lemon / day

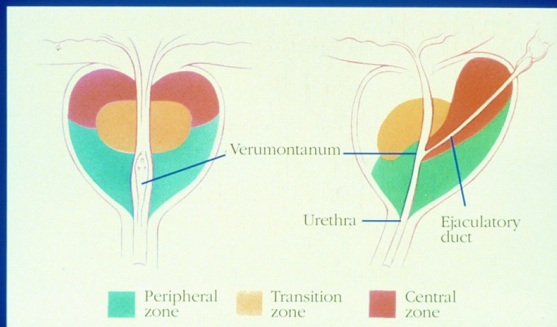
Stone Prevention Summary

- ▶ monitor fluid/diet at yearly wellbeing check
- ▶ imaging at 1 year
- ▶ imaging periodically thereafter

Benign Prostatic Hyperplasia



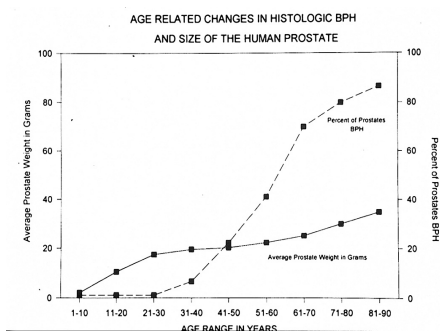
Development of Prostatic Diseases – Zonal anatomy of the prostate



BPH

- ▶ Transition zone increases in size with age

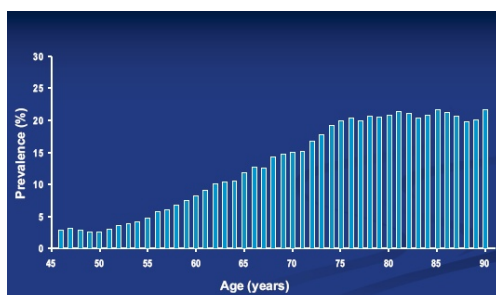
Prostate and Age



BPH

- ▶ 50% of histological BPH have benign enlargement
- ▶ 50% of benign enlargement have symptoms

Prevalence of LUTS and Age



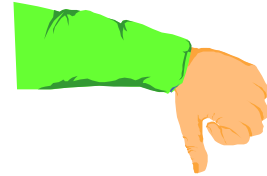
Can BPH be prevented?

- ▶ Age
- ▶ Androgens
- ▶ Genetic
- ▶ Growth factors
- ▶ Inflammation, Ischaemia, Nitric oxide

Can it be prevented?

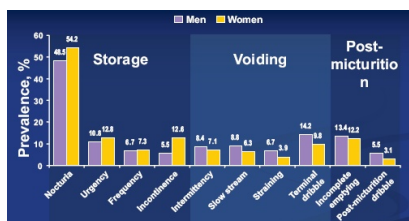
- ▶ Metabolic syndrome is associated with BPH
 - fasting glucose
 - diabetes
 - BMI

Prostatism?



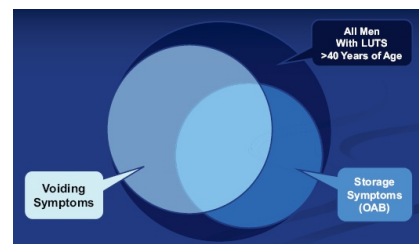
Lower Urinary Tract Symptoms

- ▶ aetiology could be bladder/prostate/urethra
- ▶ they are not sex-specific



Lower Urinary Tract Symptoms

- ▶ look at the pattern to obtain a likely diagnosis



LUTS

- ▶ voiding symptoms due to urethral narrowing
 - reduced flow, hesitancy, emptying
- ▶ storage symptoms are most annoying
 - over active bladder or obstruction
 - frequency, urgency, incontinence, nocturia

Natural History

- ▶ symptoms wax and wane



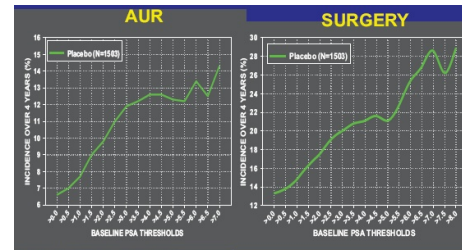
Natural History

- ▶ prostate growth 1–2g per year (age, PSA)
- ▶ retention 0.5–2.0% over 4 years
- ▶ risk increases with

age	70+
PSA	>4
volume	>40g
slower flow	<12mls/sec

PSA and Complications

- ▶ cumulative incidence of retention or surgery



History

- ▶ the bladder is an unreliable witness
- ▶ listen to the partner
- ▶ men understate their symptoms
- ▶ patients may not notice gradual changes

History

- ▶ Nocturnal enuresis is pathognomonic for chronic retention

History

- ▶ beware haematuria/pain
- ▶ abrupt ending of flow
- ▶ dysuria or infections
- ▶ difficulty voiding particularly with alcohol

History

- ▶ Fluid intake – ask volume and type
- ▶ Constipation may affect symptoms
- ▶ Past History
 - STD
 - strictures
 - surgery
 - diabetes, cancer

History

- ▶ Medications
 - anticholinergics
- ▶ Family history
 - 1st degree relative
 - 2–4 risk of TURP

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Examination

- ▶ Abdomen
 - often unrewarding
- ▶ Genitalia
 - meatal stricture
- ▶ Prostate
 - BPH (thenar eminence)
 - Ca (knuckle)
 - anal tone and sensation
- ▶ Ankles
 - oedema → nocturia

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 - bladder neck rather than prostate
 - long history
 - usually use cubicles
 - respond well to alpha blockers

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IPSS

- ▶ does not diagnose BPH
- ▶ increases with age
- ▶ basis for management

score <8	fluid
score 8+	fluid+meds
- ▶ measuring response

Management

- ▶ IPSS <8 fluid management
- ▶ IPSS 8+ fluid management
alpha-blockers
finasteride
anticholinergics
phytotherapy
- ▶ Surgery failed medical management
or complications

Fluid management

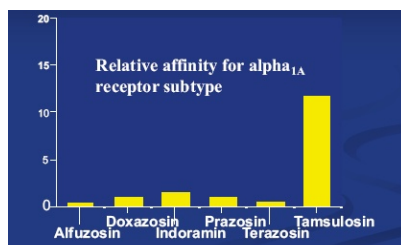
- ▶ volume
- ▶ timing
- ▶ type of fluid – caffeine, alcohol, diuretics
- ▶ can make a difference

BPH – Alpha-blockers

- ▶ Alpha 1

a	prostate
b	blood
d	bladder
- ▶ act on smooth muscle, spinal cord, afferent
- ▶ do not relieve obstruction
- ▶ do not improve residuals

BPH – Alpha-blockers



- ▶ No difference in symptoms or flow rates

BPH – Alpha-blockers

- ▶ Doxazosin
 - 50–70% respond
 - 30–50% reduction in symptoms
 - first dose effect
 - titrate from 1 – 8 mg

BPH – Alpha-blockers

- ▶ Doxazosin – side effects 10–20%
 - lightheadedness
 - palpitations
 - nasal congestion
- failure – trial Terazosin or Tamsulosin

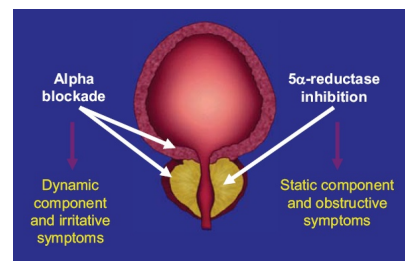
BPH – Alpha-blockers

- ▶ Tamsulosin – selective , 0.4 mg daily
 - fewer CVS side effects
 - higher anejaculation (SV,VAS)
 - floppy iris syndrome
 - special authority

BPH – Alpha-blockers

- ▶ benefit is independent of prostate size
- ▶ efficacy is similar for all agents
- ▶ retention –increases chance of voiding by 30%
- ▶ more effective than 5 alpha reductase inhibitors in the short term

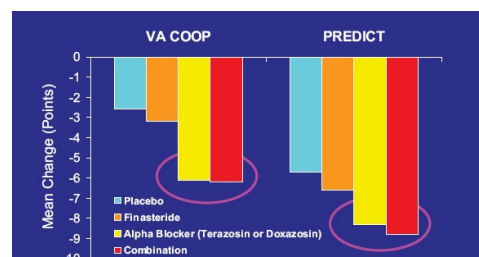
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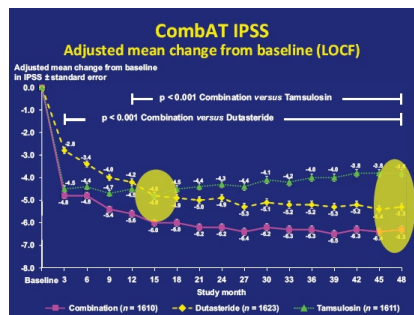
5 alpha reductase inhibitors

- ▶ Improves IPSS by 3–4 points
- ▶ reduces prostate volume – 30% over 6 months
- ▶ reduces PSA by 50% – double to give true PSA
- ▶ no change to PSA ratios

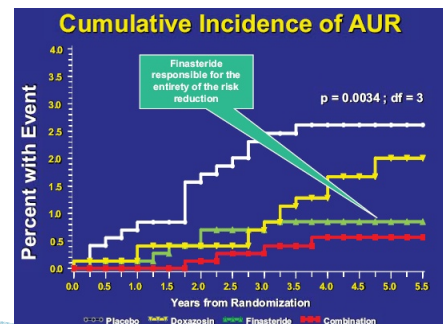
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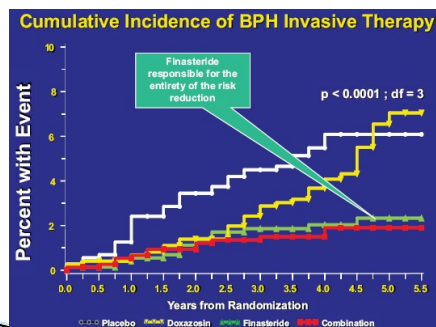
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5 alpha reductase inhibitors

- reduces the chance of surgery and retention
- reduces symptom progression
- long term probably more important than alpha blockers

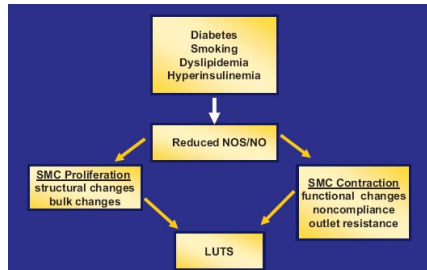
Anticholinergics

- overactive bladder common in obstruction
- only storage symptoms – overactive bladder
- may increase residual urine –check <200mls
- minimal chance of retention – around 1%

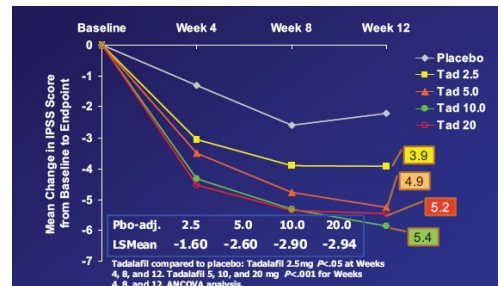
Anticholinergics

- oxybutynin 5mg bd or tds
- side effects trial Vesicare at 5mg
 - 5 mg may be better than 10 mg daily
- overall combination treatment may work well

Nitric oxide



PDE-5 inhibitors



Saw Palmetto

▶ JAMA	369 pts RCT	72 weeks
	Placebo	Saw Palmetto
IPSS pre	14.7	14.4
IPSS post	11.7	12.2
Change	-3	-2.2

Medications Summary

- ▶ alpha blockers best for <40g
- ▶ combine with 5-AR best for >40g
- ▶ anticholinergics helpful – beware residual
- ▶ 5-AR useful long term
- ▶ monitor higher PSA, volume, older

When to refer

- ▶ bothersome symptoms
- ▶ complications
 - retention
 - recurrent infections
 - bleeding
 - bladder stones
 - pain
 - incontinence
 - unresponsive