Ureteric Obstruction

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Ureteric Obstruction

Hydronephrosis (dilatation of pelvicalyceal system) = feature of obstruction

But

1. (Acute) Obstruction can occur without dilatation

2. Dilatation may ≠ obstruction

Ureteric Obstruction

Severity of dilatation ≠ severity of obstruction

Gross hydronephrosis = chronic (partial) obstruction

Acute obstruction – usually mild to moderate dilatation

Ureteric Obstruction

CT Scan – primary imaging / following US

3 critical components for renal assessment

1. *Precontrast images* - presence of calculi + baseline for evaluating enhancement

Ureteric Obstruction

CT Scan – 3 critical components

2. *Corticomedullary images* -(typical scan delay 70–85 seconds after injection) assesses early perfusion

3. *Excretory phase images* -(scan delay of 3 minutes + additional later phase) to assess late perfusion + excretion

Ureteric Obstruction

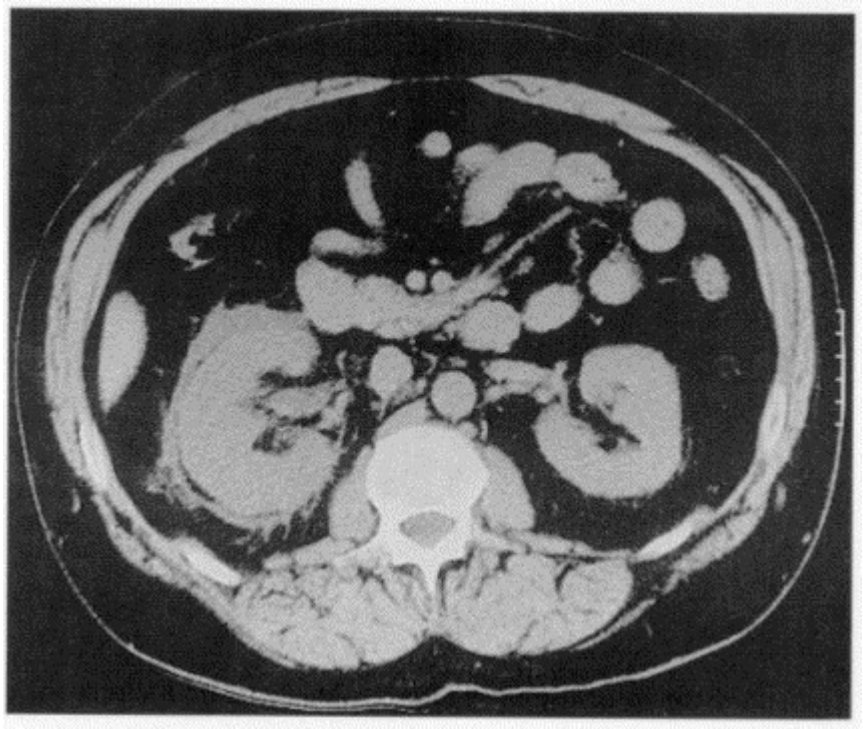
Acute – secondary features

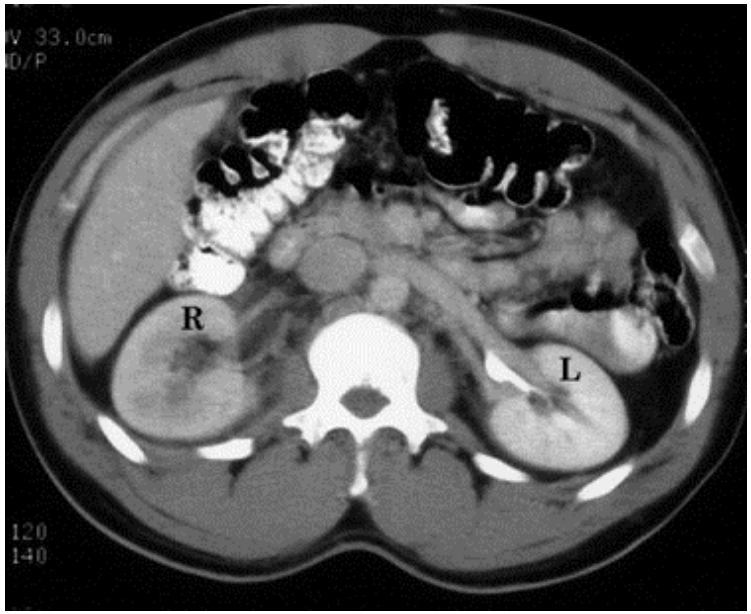
Diffuse parenchymal swelling

Reduced/delayed perfusion

Delayed/reduced excretion

‘Extravasation’





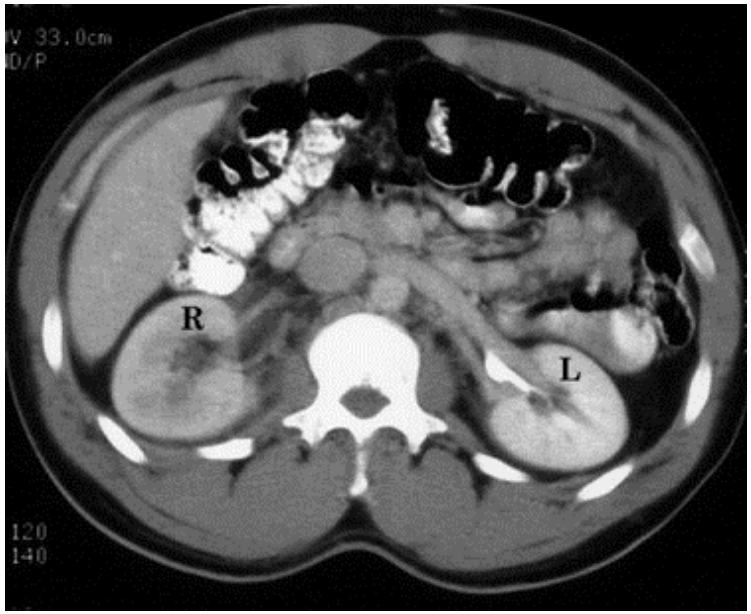
Differential Diagnosis

Renal vascular pathology

- Arterial stenosis
- Venous thrombosis

Pyelonephritis

Obstruction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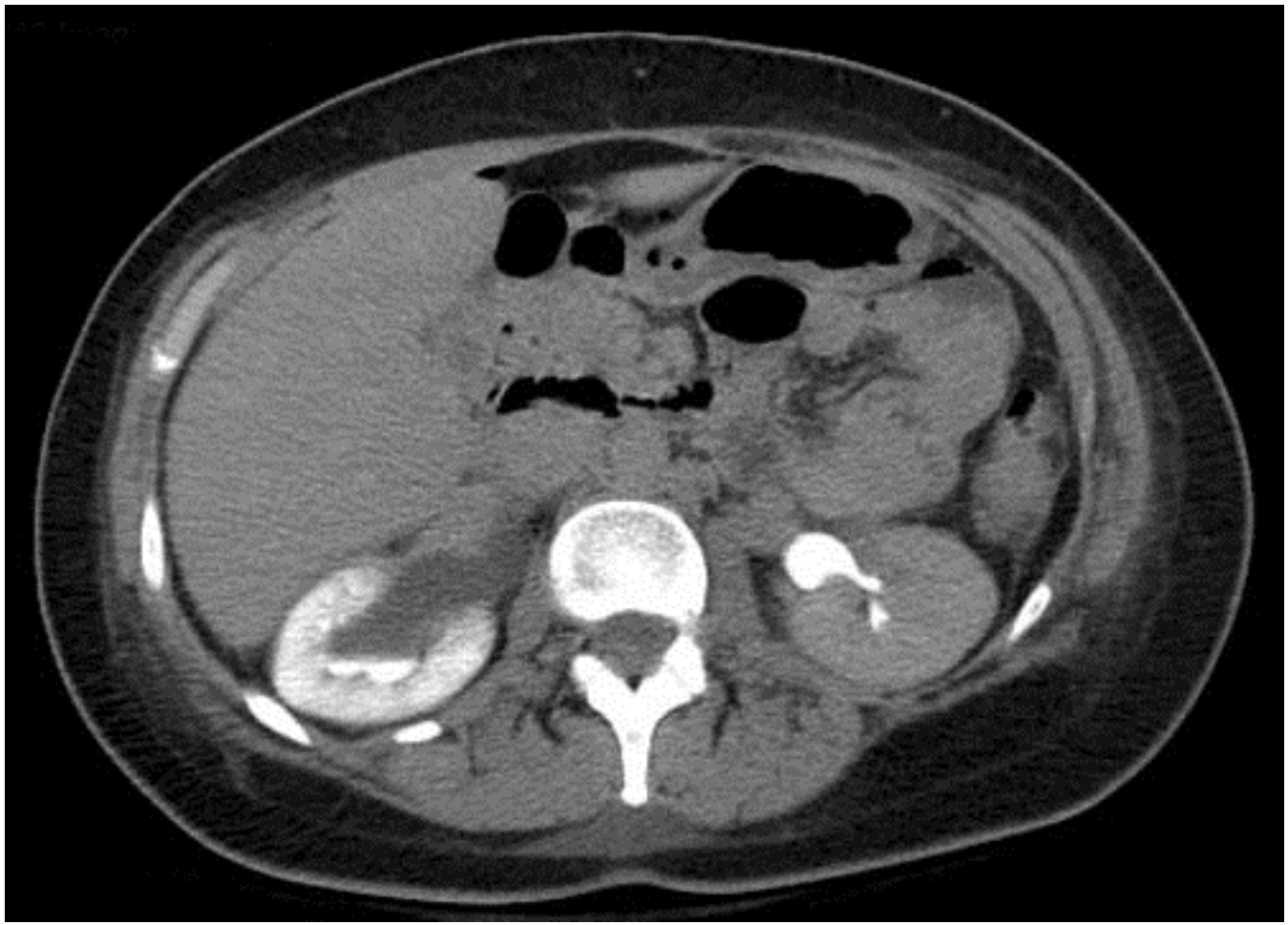

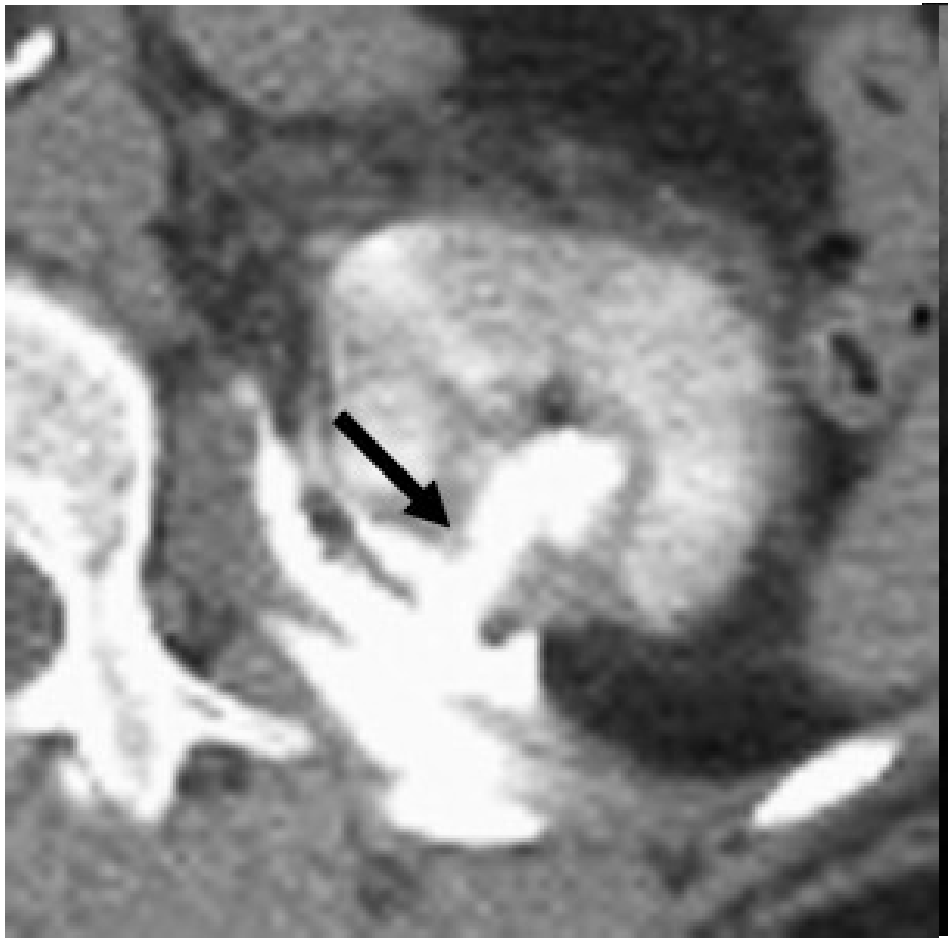

Ureteric Obstruction

Supravesical – unilateral/bilateral
- Lumenal – *calculus/*sloughed papilla
- Intrinsic – stricture/tumour
- Extrinsic – tumour/RPF/*surgical(injury)

Ureterovesical – unilateral>bilateral
- Usually calculus*
- Bladder tumour

Infravesical – usually bilateral
- Relates to bladder outlet obstruction

* ACUTE

Ureteric Obstruction

Bilateral obstruction

Usually chronic,

Occasional acute on chronic,

Rarely acute – calculus disease/surgical

Ureteric Obstruction

Acute Kidney Injury

Acute obstruction of ‘solitary’ or dominant renal unit

Acute/chronic obstruction complicated by infection

Ureteric Obstruction

Acute Kidney Injury(sepsis)

Urological emergency

Antibiotics

<u>Relief of obstruction</u>

Ureteric Obstruction

Emergency management

Decompression/drainage of obstructed system

IDC/SPC if infravesical

Stent or nephrostomy if supravesical

Ureteric Obstruction

Nephrostomy

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Ureteric Obstruction

Stents

Ureteric Obstruction

Stent vs Nephrostomy

Decompression = key objective

Resources

Timing and practicality

Patient/condition factors

Ureteric Obstruction

Resources

Interventional radiology

Vs

Urology(+theatre+GA)

Ureteric Obstruction

Stent

Operating theatre

Controlled environment – anaesthetist

Primary failure – complete obstruction eg ligation

Ureteric Obstruction

Stent

Failure to drain

Ureteric issue eg malignant obstruction

Pus (also with stent)

Ureteric Obstruction

Nephrostomy

Interventional radiology

Prone – often unmonitored

Local anaesthetic

Ureteric Obstruction

Nephrostomy - Risks

Bleeding

- perinephric/retroperitoneal haematoma

AVM

Segmental infarction

Loss of kidney

Ureteric Obstruction

Nephrostomy - limitations

Non-dilated collecting system

Coagulopathy

Anatomical(including obesity)

Ureteric Obstruction

Clinical Scenarios

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Ureteric Obstruction

Lack of drainage from nephrostomy

May reflect poor function of affected kidney

Simple flushing

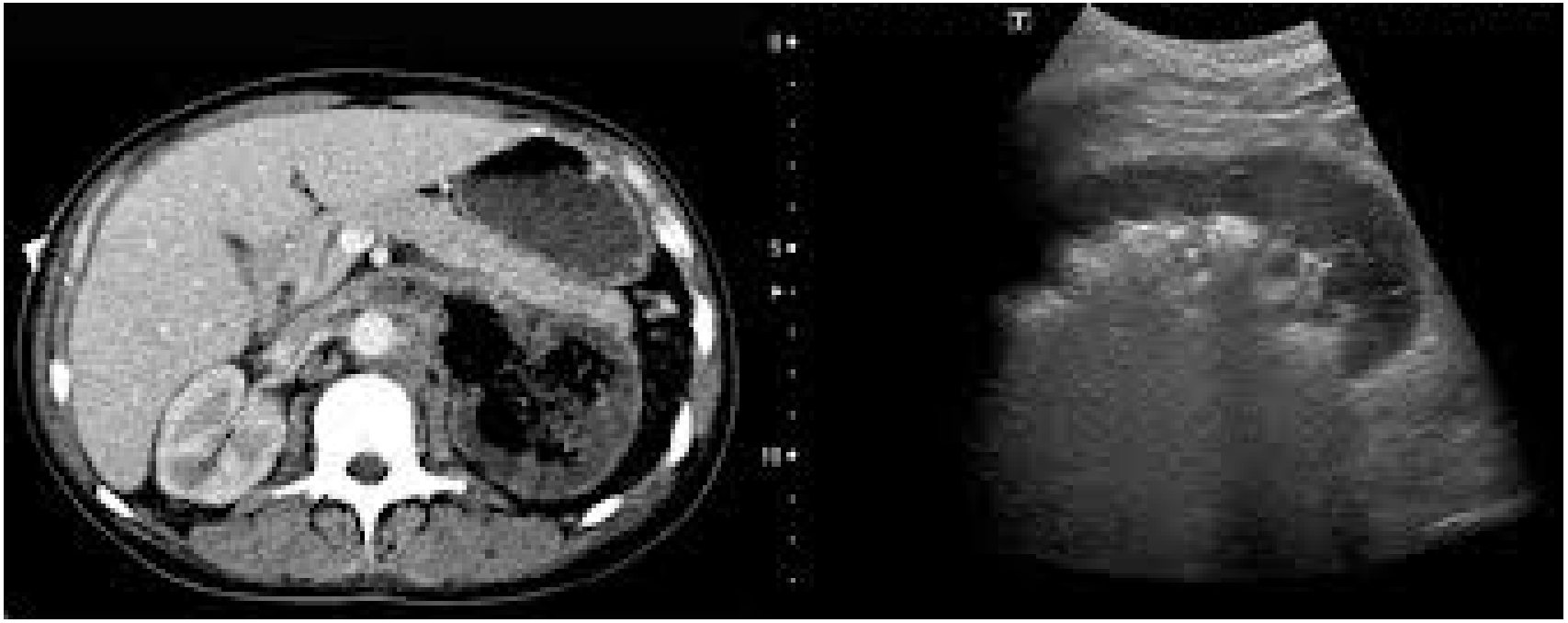
Check position – nephrostogram

Perinephric collection/abscess may evolve if displaced nephrostomy

Ureteric Obstruction

Emphysematous Pyelonephritis

- Diabetes
- Obstruction

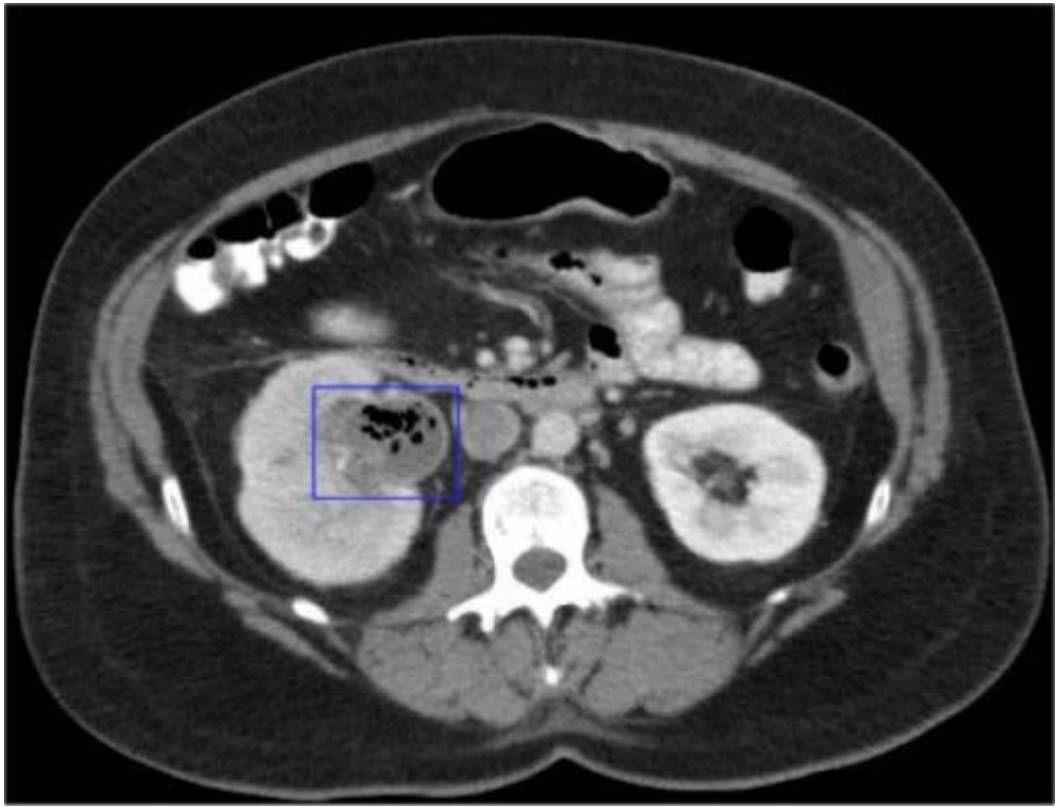


Ureteric Obstruction

Emphysematous Pyelonephritis

Diabetes

Obstruction



Ureteric Obstruction

Emphysematous Pyelonephritis

- Critical illness
- Presentation may precede ‘septic’ cascade
- Accept stenting or nephrostomy with extreme caution
- Consider nephrectomy at a VERY early stage

Ureteric Obstruction

Papillary Necrosis

May evolve as consequence of other acute illness

Ureteric Obstruction

Clinical deterioration following drainage

Reflects manipulation of infected system

Endotoxemia

Inadequate antibiotic dosing*

* Common serious error in scenario of AKI

Gentamicin Dosing

Bacteriostatic

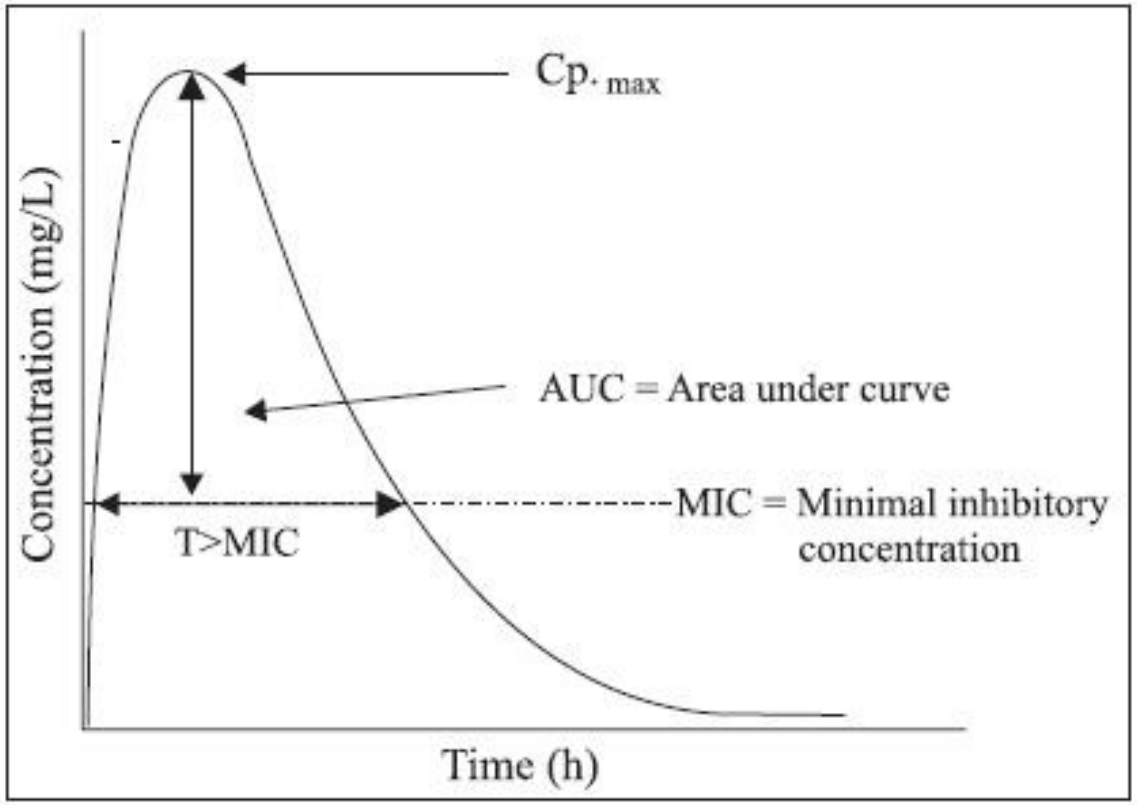
- Binds to bacterial ribosomes
- Irreversible
- Effect persists long after plasma clearance

Gentamicin Dosing

Bacteriocidal

- High concentrations
- Displaces cell biofilm associated Mg and Ca
- Disruption of polysaccharide linkages between adjacent LPS molecules

Gentamicin Dosing



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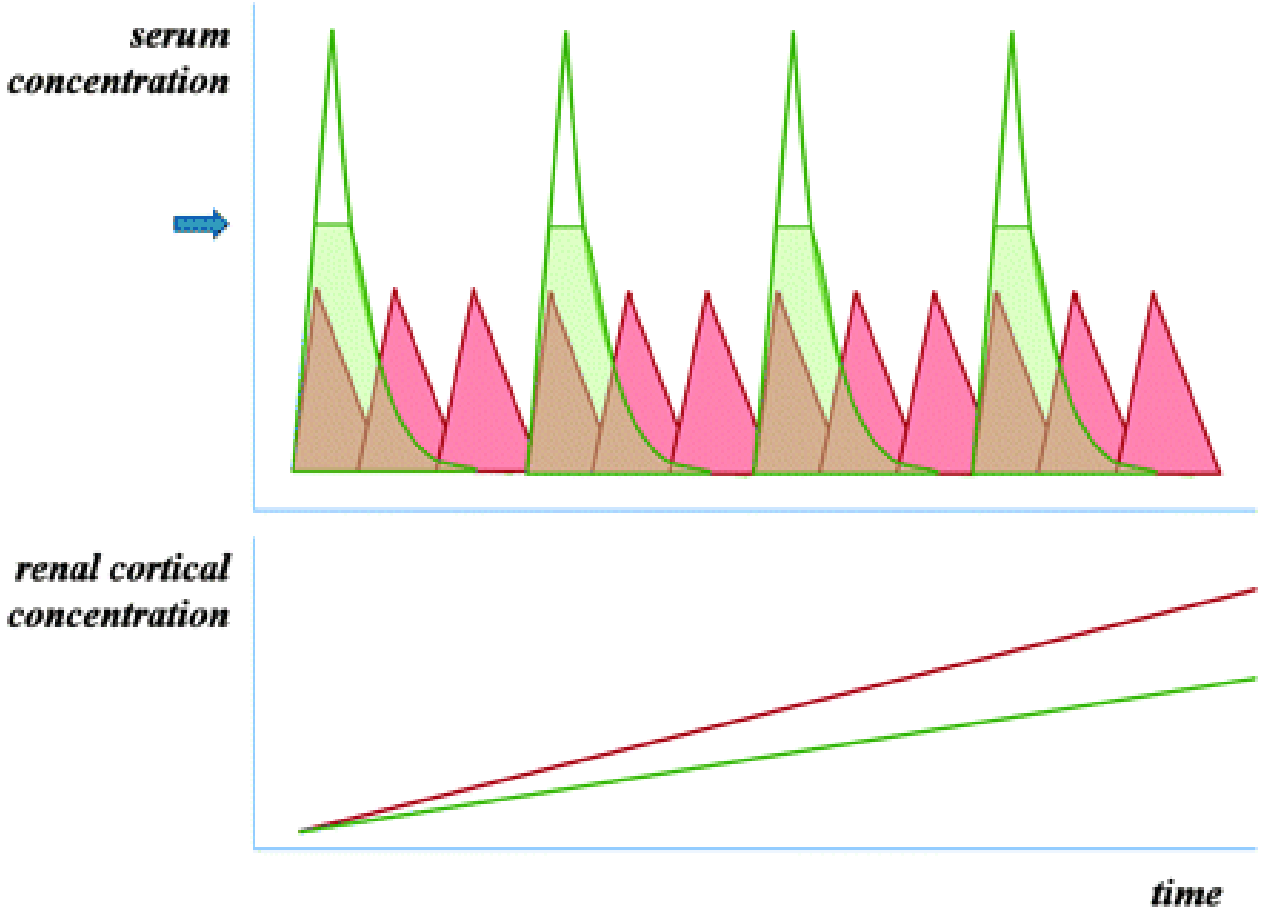
Gentamicin Dosing



Gentamicin Dosing

- Intravenous administration
- Initial dose 5-8mg/kg
- Trough level monitoring
- Repeated dosing 3-4mg/kg

Ureteric Obstruction

Clinically obvious

History/symptoms

Imaging – eg calculus + hydronephrosis

'Suspicious'

Equivocal imaging – contrast may be helpful(NB correct imaging protocol)

Ureteric Obstruction

AKI

Drainage underpins management

Resources/Clinical scenario influence choice

If associated with sepsis – emergency intervention + adequate antibiotic dosing