Investigation and Management of Pelvic Dilation

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Key Amendments

Date	Amendment	Approved by
19th Nov 2020	Document extended for 1 year	Dr J West/Paediatric QIM
26th March 2021	Approved with no amendments	Paediatric QIM
9th Feb 24	Approved with no amendments	Paediatric guideline review day

Introduction

The antenatal detection and early treatment of urinary tract anomalies provide an opportunity to minimise or prevent progressive renal damage. A major disadvantage is that minor abnormalities are also detected which do not require intervention but may lead to over investigations, unnecessary treatment and unwarranted parental anxiety.

The incidence of antenatal Renal Pelvic Dilatation is around 0.5 to 1% of all pregnancies (Dudley et al.). The Renal Pelvic Dilatation can represent a number of renal pathologies including Uretero-pelvic junction obstruction, Vesico-Ureteric Reflux, Posterior Urethral Valves and Uretero-Vesical junction obstruction. It is important to remember that after the detection of antenatal Renal Pelvic Dilatation, around 50% of postnatal scans will subsequently be normal.

Antenatal scans are usually undertaken at 12-14 weeks and 20 weeks gestation. Scans are repeated at 32 weeks of gestation to assess the abnormality noticed on earlier scans. Further antenatal investigations and referral depends upon the finding of the 20th and 32nd week scans.

Antenatal scans

During the antenatal scans, renal pelvis dilatation is assessed by measurement of the antero-posterior pelvic diameter in the transverse plan (APD), not including the calyces.

There is much debate regarding cut-off points for renal pelvic dilatation above which post natal investigation should be initiated.

Different studies have suggested an APD of 5mm to 15mm, above which post natal investigations should be initiated.

The lower the cut-off point, more investigations will be needed and hence parental anxiety is increased. Although more renal abnormalities will be detected, they will be unlikely to be of great clinical significance.

Careful assessment of bladder and ureters should be performed.

Liquor volume needs careful assessment.

Indications for antenatal referral to a foetal unit

Oligohydramnios with any renal anomaly
Abnormal bladder, ureterocele, absent bladder
Abnormal renal parenchyma; echogenic, large or small kidneys
Bilateral renal pelvic dilatation where APD is >15 mm

Solitary kidney where renal pelvic dilatation is >15mm

Post natal investigations

Traditionally, all infants with antenatal Renal Pelvic Dilatation received prophylactic antibiotics and underwent postnatal radiologic investigations with a renal ultrasound and MCUG even in the setting of a normal post-renal ultrasound. The MCUG was included because VUR can be present in the setting of a normal ultrasound.(Aksu et al.;Lee et al.) Recent studies suggest that VUR is typically mild and self-limited in infants with normal post-natal ultrasound.(Merlini et al.)

A meta-analysis by Sidhu et al reported that 98% of all mild Renal Pelvic Dilatation (APD<12 mm) resolved, stabilised or improved on follow up.(Sidhu, Beyene, and Rosenblum). Another study of 103 infants with antenatal Renal Pelvic Dilatation had 53 infants with normal postnatal ultrasound. Out of these 53 infants, only 3 were found to have VUR on routine MCUG and all 3 were grade 1 VUR. 34 infants were identified as having mild Renal Pelvic Dilatation on postnatal scans (APD 7-15mm), only one of this group developed UTI during 2 year follow up.(Lidefelt and Herthelius).

An additional cohort study of 105 infants with an APD of 5-14mm had a low rate of VUR, and only 2 infants developed UTI in the follow up period.(de Kort, Bambang, and Zegers;Lidefelt and Herthelius).

Postnatal investigation should be limited to following groups:

- Unilateral renal pelvic dilatation >10 mm at 32 weeks of gestation
- Bilateral Renal Pelvic Dilatation with APD >10mm at any gestational age
- Renal Pelvic Dilatation in a solitary kidney with APD >10mm at any gestational age
- Renal Pelvic Dilatation associated with ureteric dilatation

Prophylactic Antibiotics.

The role of prophylactic antibiotics in children with antenatal detected Renal Pelvic Dilatation, who are waiting for post-natal investigations, is controversial.

Children with Renal Pelvic Dilatation are shown to have a significantly higher risk of developing urinary tract infection than controls.

While it is presumed that preventive antibiotics will prevent UTI in children with Vesico-Ureteral Reflex, it has yet to be proven.

Most units still use antibiotics in children who need post-natal investigation although the trend is changing and some units will administer antibiotic to a limited group of children.

Mallik and Watson divided their cohort of infants with isolated antenatal Renal Pelvic Dilatation into two groups. The first group, designated NSD1 (non-specific dilatation) consists of infants with post-natal ultrasound showing APD<10mm and no ureteric dilatation. The second group, NSD2, contained infants with a post-natal APD >10mm but with a normal MCUG. Infants in both groups did not receive prophylactic antibiotics. Out of 170 infants in the two groups combined, only one child developed UTI in follow up.(Lidefelt and Herthelius;Mallik and Watson)

The following children should be considered to receive prophylactic antibiotics:

- All infants who need MCUG
- Renal pelvic dilatation with dilated calyces
- Renal pelvic diameter >10mm.

Commonly used prophylactic antibiotics are:
Amoxicillin
Cefalexin
Trimethoprim 2 mg/kg nocte

Ultrasound

Ultrasound should be delayed where unilateral renal pelvic dilatation is present without ureteric dilatation, as neonates are usually oligureic for the first few days of life. This can be booked within 2 months.

Ultrasound should be done within first week of life or early if there is:

- Bilateral Renal Pelvic Dilatation> 20 mm each side
- Renal Pelvic Dilatation in a solitary kidney >20 mm
- Urine not passed for 24 hours
- Abnormal bladder or history of oligo/anhyraminos

Ultrasound must include:

- Measurement of renal length, assessment of appearance and echogenecity
- Measurement of the renal pelvic antero-posterior diameter in the transverse plan
- Assessment of calyces
- Appearance of bladder with measurement of wall thickness, presence of ureterocele, and post-micturation residue.

MCUG

The study by Mallik et al highlights the safety of using a limited postnatal evaluation of a select group of infants with antenatal renal pelvic dilatation. They conclude that routine MCUG is not indicated in infants with normal post-natal ultrasound after birth. A normal ultrasound included APD<10mm, no ureteric dilatation, normal size kidneys and no bladder abnormalities.(Mallik and Watson)

MCUG should only be booked after discussion with a consultant/senior registrar.

MCUG should be considered if post-natal ultrasound shows

- Bilateral renal pelvic dilatation >10 mm
- Renal pelvic dilatation in a single kidney > 10mm
- Distended or thick walled bladder

MAG 3

MAG 3 is done to get information about the function of each kidney in relation to other. It provides information about patency of renal tract and is gold standard to rule out obstruction in renal tract. Indirect cystogram can be used to look for VUR.

MAG 3 should only be booked after discussion with a consultant/ senior registrar

Indications for MAG 3

- APD more than 20mm
- Ureteric dilatation

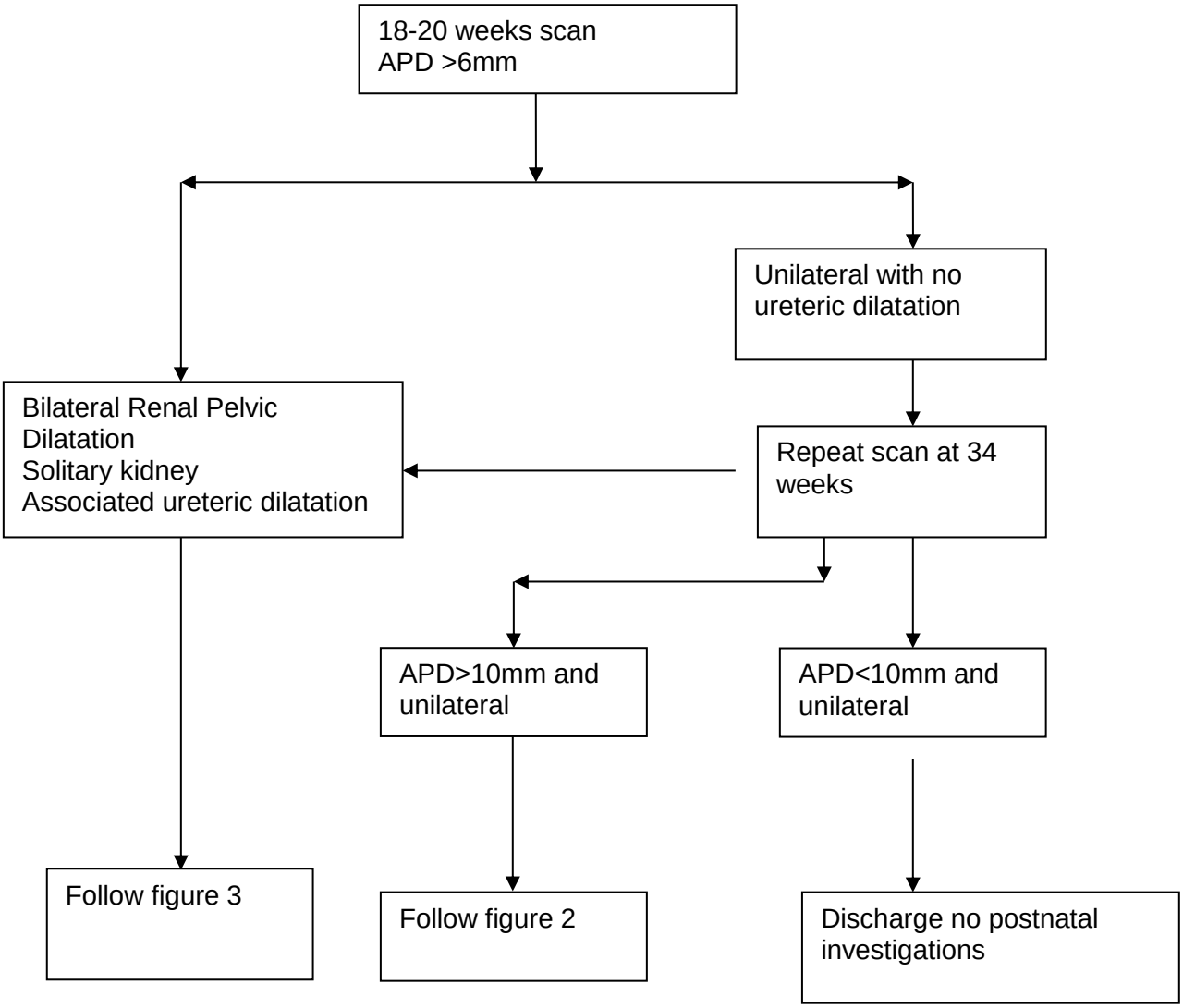
Antenatal renal pelvic dilation

A quick guideline for SHOs

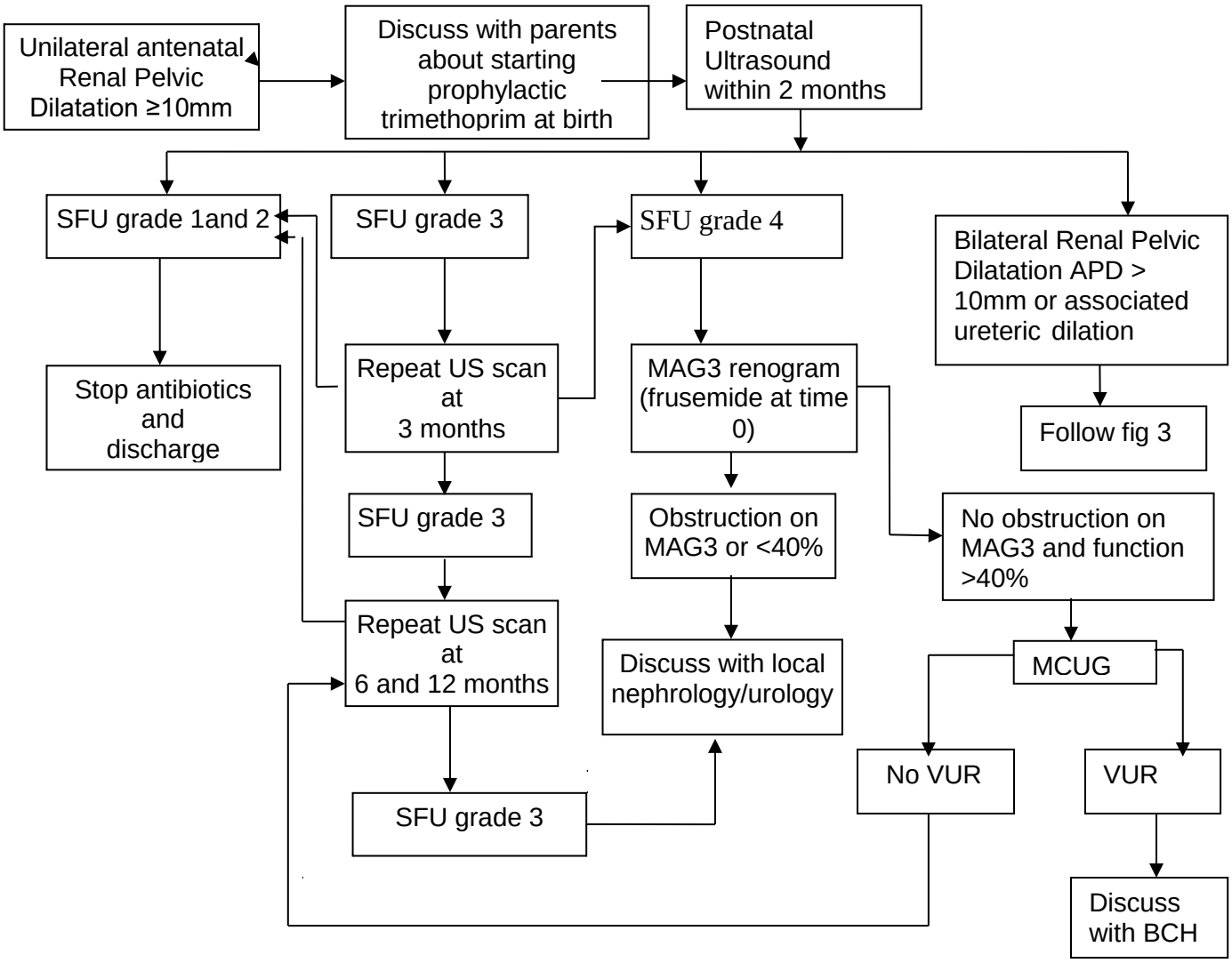
Unilateral/ Bilateral	AP diameter of renal pelvis	Action for SHO
Unilateral	<10 mm	Nil
	>10 mm	Trimethoprim 2 mg/kg nocte USS within 2 months

		Neph clinic (Redditch, Worcester and KTC) after scan
Bilateral	>10mm	Trimethoprim 2 mg/kg nocte USS at one week Neph clinic (Redditch, Worcester and KTC) after scan Baby will need urgent U/S and MSUG if does not pass urine within 24 hours.

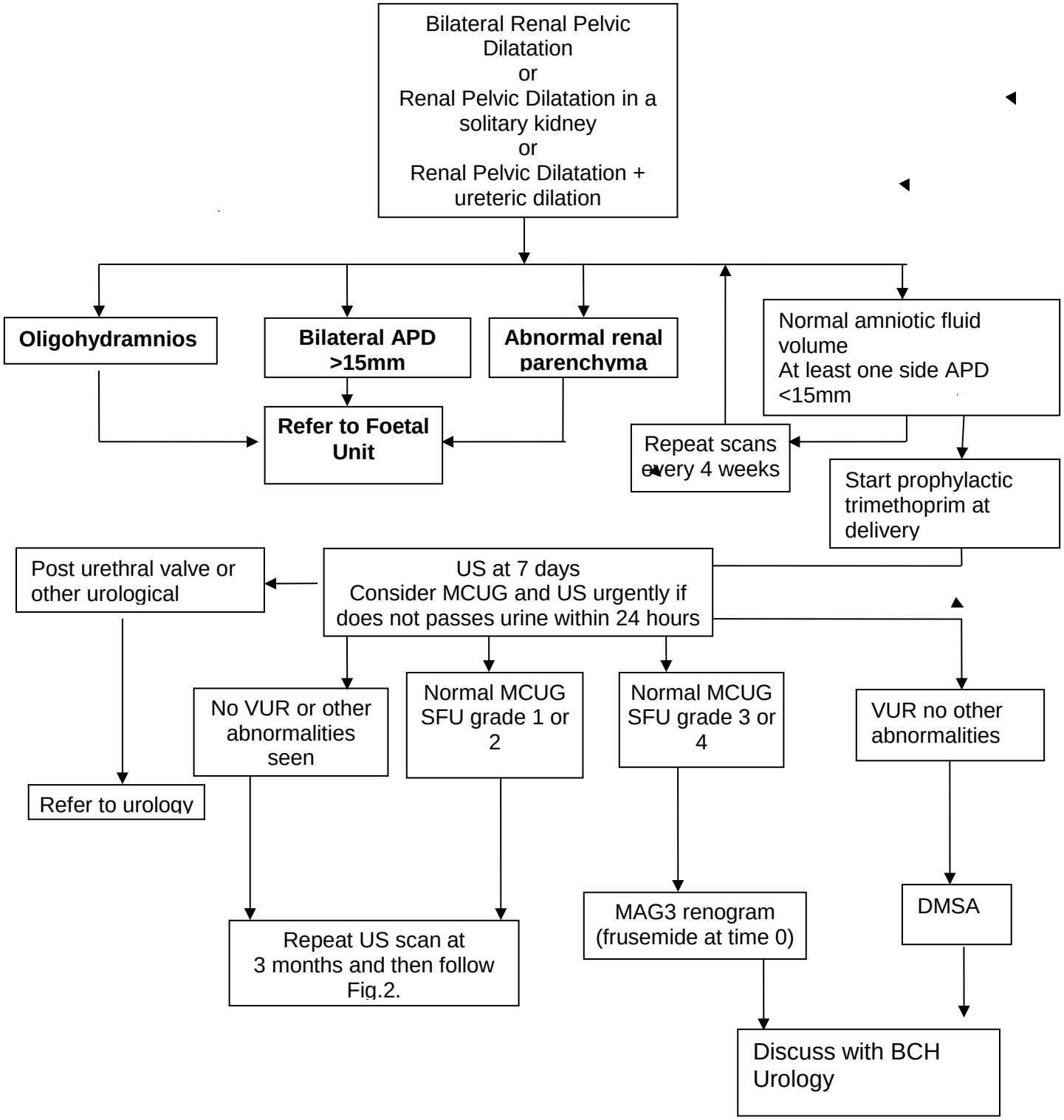
Antenatal Management of Renal Pelvic Dilatation



Detailed Guidelines to be used by senior Paediatric staff Management of Unilateral Renal Pelvic Dilatation



Management of Bilateral Renal Pelvic Dilatation



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