

# Sound ADVICE

A SUFW Clinical Update

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## Mild Renal Pyelectasis

Pyelectasis is the term used to describe dilatation of the renal pelvis, although the definition of mild dilatation remains controversial. The most commonly quoted definition of mild renal pyelectasis is a cross-sectional renal pelvic anteroposterior diameter of 4-10 mm with no dilatation of the intrarenal system (Figure 1). The exact renal pelvis dilatation that is accepted as normal is still being debated. However most would agree that greater than 10 mm is more likely to be associated with pathology. Between 4 and 10 mm, it is more difficult to accurately predict outcome.

The prevalence of mild renal pyelectasis in prenatal ultrasound examinations is 3-5%. It is most frequently noted in the left kidney and there is a gender bias, with renal pyelectasis being more prevalent in males. Possible underlying pathologies, such as cystic kidney disease, posterior urethral valves and duplication of the ureters can usually be excluded at the time of the morphology ultrasound examination. However, mild renal pyelectasis has been associated with other pathologies that may not be immediately apparent; including Down syndrome, subsequent hydronephrosis and vesico-ureteric reflux.

### DOWN SYNDROME

Mild renal pyelectasis is a common finding in fetuses with Down syndrome. It is however also a common finding in fetuses that are normal. In the absence of other markers, renal pyelectasis is considered a very weak indicator of Down syndrome. In an unscreened population of

pregnant women, the finding of mild renal pyelectasis at the 18-20 week ultrasound increases the age-related likelihood of Down syndrome by approximately 1.6. Whether this likelihood ratio can be used in a population of pregnant women previously screened by nuchal translucency assessment or the Triple Test is currently not known, making counselling difficult in this setting. Maternal age, the results of previous screening tests, the presence or absence of other markers of aneuploidy, and parental anxiety are all-important considerations in weighting the role of amniocentesis in the investigation of renal pyelectasis.

### HYDRONEPHROSIS

Hydronephrosis is dilatation of the renal pelvis and calyces, most often due to obstruction of urine outflow into the ureter or bladder, or vesico-ureteric reflux. The significance of mild fetal pyelectasis for predicting subsequent hydronephrosis is controversial. In those fetuses with mild fetal renal pyelectasis at 18-20 weeks, approximately 10-15% may progress to hydronephrosis, and parents should be made aware of this.

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Various thresholds have been recommended with varying detection and false positive rates. The thresholds and associated sensitivity and specificity for development of hydronephrosis are gestation dependant, implying that progressive dilatation is generally seen with this condition. In one study, thresholds of >7mm at 27 weeks and >10mm from 33 weeks had a specificity of approximately 90% and sensitivity of approximately 70% for development of hydronephrosis. In another, it was found that fetal pyelectasis of 8 mm at any gestation was 91% sensitive and 72% specific in predicting subsequent hydronephrosis, while 5 mm yielded a sensitivity of 100% and a specificity of 24%. On the basis of these findings, it has been recommended that women with ultrasonographically detected antenatal fetal pyelectasis of  $\geq 5$  mm at any gestational age have follow-



Figure 1. Transverse fetal abdomen showing renal pyelectasis.

up ultrasound examinations, to ensure 100% detection of those who will develop hydronephrosis.

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## VESICO-URETERIC REFLUX

Vesico-ureteric reflux (VUR) refers to retrograde flow of urine from the bladder into the upper urinary tract. It is a common problem persisting in 1% of otherwise healthy children. Of fetuses with 4-10 mm of renal pyelectasis, approximately 16% have reflux. However, VUR is present in up to 40% of those prenatally diagnosed with hydronephrosis. Reflux is bilateral in about half of these babies, with an 80% male preponderance.

The degree of pelvis dilatation in fetal life does not correlate closely with the grade of reflux, although it is associated with presence of reflux. The presence of persistent renal pyelectasis should therefore prompt neonatal assessment for both presence and grade of VUR, as it is the grade of

reflux that is most prognostic for eventual renal scarring and functional deterioration.

## ANTENATAL MANAGEMENT

After the detection of renal pyelectasis at 18-20 weeks, it is controversial whether a sonographic re-assessment is warranted in the third trimester, as some would argue that all fetuses with renal pyelectasis should be investigated in the neonatal period. There is however increasing evidence that only those fetuses where dilatation persists after 28 weeks should be subjected to postnatal reassessment. A third trimester scan should therefore be considered at around 34 to 36 weeks, which is also a convenient time to assess fetal growth and well being.

## CONCLUSION

Antenatal ultrasonography is an effective tool for identifying fetal urinary tract abnormalities. Fetal renal pyelectasis is a common and controversial finding. An AP diameter  $\geq 4$ mm in the second trimester probably warrants third trimester reassessment with post-natal investigation if dilatation of  $\geq 5$  mm persists. If reassessment is not performed in the third trimester the finding of mild renal pyelectasis should be brought to the attention of the neonatologist.

## Endometriosis

Endometriosis is characterized by the presence of endometrial glands and stroma outside the endometrial cavity and uterine musculature, with the pelvis being the most common site for the disease. Theories proposed to explain histogenesis include implantation of desquamated endometrial tissue within the pelvis secondary to retrograde menstruation, and metaplasia of peritoneal coelomic cells into endometrial tissue, a process possibly facilitated by release of cytokines by refluxed endometrial debris. The true prevalence of endometriosis in the general female population is not known, however a familial tendency has been recognized. If a woman has endometriosis, a first-degree female relative has a 7% likelihood of being similarly affected.

Many women with endometriosis are completely asymptomatic but it is a common gynaecologic problem in the reproductive-age woman who presents with pelvic pain, dysmenorrhea, dyspareunia, abnormal uterine bleeding or infertility. Frequently, there are no obvious findings on pelvic examination. When findings are present, the most common is tenderness when palpating the posterior fornix. Nodules of endometriosis on the uterosacral ligaments, enlarged ovaries as a result of endometriotic cysts, and a uterus retroverted and fixed in the cul-de-sac by adhesions may also be detected. Endometriosis should always be considered in the reproductive-age woman with an adnexal mass.

Because endometriosis is located primarily in the pelvis, laparoscopy is the preferred technique to make an accurate diagnosis, ideally supported by biopsy and histology. The age at time of diagnosis is commonly 25 to 35 years.

Endometriosis is not seen in prepubertal children and is rarely a clinical reality in postmenopausal women. Still, it is present in approximately 1% of women undergoing major surgery for all gynecologic indications, 6% to 43% of women undergoing sterilization, 12% to 32% when laparoscopy is performed to determine the cause of pelvic pain in reproductive-age women, and 21% to 48% of women undergoing laparoscopy for infertility. Endometriosis is underdiagnosed in teenage years although it is found in 50% of teenagers who do undergo laparoscopy for evaluation of chronic pelvic pain or dysmenorrhea.

Endometriotic foci, particularly on the ovarian surface, may develop a fibrous enclosure and manifest cyst formation as a result of accumulation of fluid and blood. These endometriotic cysts ("endometriomas") vary from several millimeters to over 10 cm in size. Bleeding with menses gives the cyst a dark-red or bluish haemorrhagic colour. The degradation of blood pigment over time results in thick, tarry contents, and hence the term "chocolate cysts". Occasionally, the contents change to a yellow straw colour or clear fluid.



Figure 1. Ovarian endometrioma (adjacent to iliac vessels) with classical echogenic 'ground-glass' appearance of its contents.

Ultrasound can be used to identify ovarian endometriomas, but it is of little utility in diagnosing speckled peritoneal disease as discrete small deposits of functioning endometrial tissue on peritoneal surfaces cannot be demonstrated with ultrasound. Indeed, peritoneal endometriosis is almost always beyond the resolving power of ultrasound, computed tomographic scanning and magnetic resonance imaging. It is only when pelvic endometriosis develops into an endometrioma then these cystic lesions can usually be seen and identified.

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Many reports describe endometriotic cysts as having typical ultrasound features, but in reality the sonographic appearance varies greatly. Mature ovarian endometriomata

are easiest to identify as they are usually well-circumscribed thin or thick-walled, unilocular cysts that contain homogeneously echogenic fluid (Figure 1). This so-called "ground-glass" appearance of the cyst content is due to altered blood. While this is usually taken as the "classic" appearance of an endometrioma, alternative appearances include the presence of internal septa in about 10% to 30%, low-level echogenic or echo-free content, and the presence of a fluid-fluid level created between old altered blood and fresh bleeding. The haemorrhagic contents may also have a trabecular pattern that looks complex, so mucinous epithelial and endometrioid tumours may be part of the differential diagnosis along with haemorrhagic cysts and dermoids.

The accuracy of assessing a pelvic cyst as an endometrioma is far superior when ultrasound is performed transvaginally as this allows close assessment of the cyst content. Because of the absorption of ultrasound by body tissues, a deep pelvic cyst that appears simple on transabdominal imaging will occasionally reveal itself to have an echogenic content when examined transvaginally. The role of colour Doppler imaging in the diagnosis of endometriomata is limited but may assist in differentiating an endometrioma from a haemorrhagic corpus luteum. Where ultrasound raises the differential diagnosis of an endometrioma or haemorrhagic cyst, a repeat ultrasound examination some weeks later will usually resolve the diagnosis, as an endometrioma will generally be a persistent feature while a haemorrhagic cyst will most often spontaneously resolve.

**References**

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**4-D Ultrasound at SUFW**

The world's first Real-Time 4D Ultrasound System, the VOLUSON 730, has been installed in the Newtown rooms of SUFW. The VOLUSON 730 is the only ultrasonography system available to offer continuous display of three-dimensional images in real-time (i.e. not static 3-D).

This technology is a significant enhancement of the diagnostic capabilities offered by Sydney Ultrasound for Women (SUFW). It is particularly useful in defining certain fetal structural abnormalities found in routine 2D imaging, and assists in counselling parents whose fetus is affected by a structural abnormality as they are now able to 'see' the abnormality in 3D. The 4D capabilities at SUFW are only used where clinically indicated. The ability to image a fetus using 4D technology should not lead to an expectation by patients that 4D assessment will occur at the time of routine ultrasound examinations.

The specialists at SUFW are also developing the gynaecological use of 4D ultrasound in the assessment of the non-pregnant uterus and ovaries, where there is an emerging role of 4D ultrasound for defining the position and extent of gynaecological disease and pelvic mass pathology prior to surgery. Research interests in 4D ultrasound at SUFW include assessment of Mullerian defects of the uterus and endometrial assessment. Collaborative research programs are also planned to study the utility of 4D ultrasound in assessing paravaginal defects of the pelvic floor.



Figure 1. The fetal face and arm in 3D.



## Free Nuchal Translucency and Sonohysterography Education Presentation

As part of its ongoing commitment to educate the medical community on obstetric and gynaecological ultrasound issues, Sydney Ultrasound for Women (SUFW) is presenting a free update on Nuchal Translucency (NT), first-trimester serology screening and Sonohysterography. First trimester screening for chromosome abnormalities using nuchal translucency and serum screening will be discussed, as will saline infusion sonohysterography in the assessment of abnormal uterine bleeding.

The education session will be presented by SUFW partners Dr Andrew McLennan, [BSc MB BS(Hons)UNSW FRANZCOG MRCOG COGU] and Dr Tom Boogert [MB MS (Syd) FRANZCOG DDU COGU].

*Four Continuing Professional Development points have been granted for the session by the RACGP.*

The date for the session is Tuesday July 23, starting at 6.30pm. The venue is the Sydney Rowing Club in Abbotsford, Sydney. Dinner is being provided at no cost to attendees. Those interested in attending should provide their details to Raquel Smees at SUFW on 9553 6512 or [smees@sufw.com.au](mailto:smees@sufw.com.au)

The evening is being sponsored by Elevit, a pregnancy and breastfeeding supplement that has been specially formulated by Roche to meet the increased needs of the mother-to-be and her baby. Elevit Pronatal (Elevit plus vitamin A) has been shown in clinical trials to reduce the likelihood of certain birth defects including defects of the spine and brain, heart, urinary tract and limbs. For more information or patient samples please phone Roche Consumer Health on 1800 023 884.

### SUFW Locations

Suite 3, 29 Belmore Street, **BURWOOD** NSW 2134  
☎ 9745 4054

1st Floor, 56 Neridah St, **CHATSWOOD** NSW 2067  
☎ 9413 9196

1st Floor, Suite 7, 22 Belgrave St, **KOGARAH** NSW 2217  
☎ 9553 9611

Suite 205, 2nd Floor, 161 Bigge St, **LIVERPOOL** NSW 2170  
☎ 9822 8447

RPAH Medical Centre, 404/100 Carillon Ave,  
**NEWTOWN** NSW 2042  
☎ 9516 2064

Randwick Specialist Medical Centre, 135 Belmore Rd,  
**RANDWICK** NSW 2031  
☎ 9399 9255

2nd Floor, 4 O'Connell St, **SYDNEY** NSW 2000  
☎ 9221 8099

## Talking Teamwork at SUFW

The depth of expertise at Sydney Ultrasound for Women (SUFW) goes beyond their six obstetricians and gynaecologists. It also extends to the administration staff and sonographers who work for the organisation.



*From left to right: Jilane Anderson, Margaret Doyle and Sharon O'Malley*

Sonographer Margaret Doyle for instance, has been scanning with SUFW for 24 years. "We have highly trained staff in the fields of obstetric and gynaecologic ultrasound here," she says. "That's critical as the relationship we have with patients is fundamental to our work."

"There's a great deal of responsibility in what we do," says Jilane Anderson, one of Margaret's sonographer colleagues at SUFW's Kogarah rooms. "And it's something we all take very seriously. But there is also a lot of pleasure involved as you never get tired of giving good news to women and their families."

Sonographer Sharon O'Malley can't resist applying an analogy from outside her day job to her vocational experiences, saying SUFW staff are just like a soccer team. They work together to meet a common objective: to exceed the expectations of their patients and referring doctors.

"We are dedicated to patients requirements and needs," stresses Sharon. "We do obstetrics and gynaecology all day and every day so we are specialists in the field. The team here is a multi-disciplinary one with the support given and received from everyone being outstanding. The dedication and enthusiasm is definitely contagious!"

"On a personal level I really appreciate the SUFW doctors' abundance of knowledge," says Sharon. "Their expertise is a real asset. My development as an ultrasound professional has been enhanced ten-fold by their qualifications and experience and they are always happy to explain anything about their work here."

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