Multiple Pregnancy

New Zealand
Maternal
Fetal
Medicine
Network

This guideline was updated in September 2015 by Dr Emma Parry with input from members of the New Zealand Maternal Fetal Medicine Network.

Background

The first NZMFMN monochorionic pregnancy guideline was developed in 2009 to coincide with the introduction of the Selective Fetoscopic Laser Photocoagulation for Twin to Twin Transfusion Service in New Zealand. The aim was to provide a basic Ultrasound guideline to allow early detection of complications of monochorionic pregnancies and promote early referral to secondary and tertiary services.

Since the development of the first guideline there have been a number of areas of new knowledge which are now incorporated into the guideline.

Twin pregnancy occurs in approximately 2% of pregnancies and the rate is increasing. This is thought to be due to increasing maternal age and increasing use of assisted reproductive technologies which are both known risk factors for multiple birth. 1/3 of twin pregnancies are higher risk by virtue of having a single shared placenta (monochorionic placenta).

At term, the cumulative loss rate for Dichorionic (DC) twins is approximately 2%. For Monochorionic (MC) twins it is 8%. This means that of all Monochorionic twins identified early in the first trimester, only 92% of them will result in twin livebirths.

All twin pregnancies have increased rates of anomaly, preterm birth (spontaneous and iatrogenic), Pre-eclampsia, selective fetal growth restriction (sFGR), Gestational Diabetes Mellitus (GDM) and complicated delivery.

The excess rate of losses in MC twins is secondary to the unique placental configuration and excess anomalies. 10-15% of MC twins will develop Twin to Twin Transfusion Syndrome (TTTS).

This most commonly occurs between 16-26 weeks gestation and untreated has a perinatal mortality rate of 80-90%. In this situation one twin receives more blood flow than the other by virtue of unidirectional flow along connecting vessels. This diagnosis carries an extremely poor prognosis and it can be responsible for up to 20% of all perinatal deaths in twins. The initial finding is of discordant amniotic fluid volumes.

Twin Anaemia Polycythaemia syndrome (TAPS) is part of the spectrum of conditions attributable to anastomoses on the placenta. It usually occurs later in pregnancy and has a better prognosis. It is characterised by one twin being anaemic and one polycythaemic without the discordant amniotic fluid associated with TTTS.

sFGR is also a common complication of a MC twin pregnancy. It is secondary to unequal sharing of the placental mass and if it occurs early can have a poor outcome. It often occurs in combination with TTTS making diagnosis and treatment planning difficult.

Demise of one fetus can have a significant effect on the sibling:

Risks for co-twin after demise of one twin after 14 weeks gestation		
	DCDA twins % (95% C.I.)	MCDA twins % (95% C.I.)
Co-twin death	4 (2-7)	12 (7-18)
Neurologic abnormality	1 (0-7)	18 (11-26)
Preterm birth (< 37 weeks)	57 (34-77)	68 (56-78)

Rarer complications of MC twins include monoamniotic twins, the Twin-Reverse Arterial Perfusion (TRAP) sequence and conjoined twins.

In many areas there is no high quality evidence to guide pregnancy care. In this situation a pragmatic approach which is aimed to be accessible throughout New Zealand is adopted.

Objective

- To guide the accurate diagnosis, ongoing care and management of women with multiple pregnancy and related complications
- To provide a consistent approach to the care of women with multiple pregnancy

Definition

Multiple Pregnancy is where there is more than one fetus. Monochorionic twins are those sharing a placenta which can contain vascular connections between the two parts of the placenta.

Important History

Dichorionic twinning is more common where there is a family history. Monochorionic twin pregnancy is more common where assisted reproductive technology has been used.

Ultrasound

Determining chorionicity

- For the purposes of dating use the largest CRL, unless the pregnancy was conceived by assisted reproduction, in those cases the date of intrauterine insemination or ovum pick-up should be used. Optimal dating of the pregnancy by CRL should be between 10+0 and 12+6 weeks gestation. From an HC > 80 mm (13+0 weeks) dating should be done using the mean of the HC if there is no previous dating scan
- The first scan if done prior to 15 weeks will have nearly 100% accuracy in determining chorionicity

- Lambda sign (λ) indicates dichorionic diamniotic pregnancy, 2 separate placentae has specificity of 100%, but can often only be used in the first trimester because placenta's often fuse later in gestation. Fetuses with different gender are always dizygous and therefore dichorionic
  - Tau sign (τ) sensitivity of 100% and specificity 98%, thickness of membranes less than 1.5 mm or empty Lambda sign indicates monochorionic diamniotic pregnancy
  - Absence of membranes indicates monochorionic monoamniotic pregnancy
- It is standard practice for ultrasonographers to comment on chorionicity at the time of an early scan. The images of the determination of chorionicity need to be available for future reference
- If a scan <15 weeks confirms a twin pregnancy but does not clearly state chorionicity, it should be repeated or reviewed
- If Monochorionic monoamniotic twinning is suspected a Transvaginal scan should be offered to the woman if available

11-14 weeks scan

- Nuchal Translucency (NT) is as accurate in twin pregnancies as in singletons and can provide individual risk of aneuploidy to each fetus. In Dichorionic twins each NT is combined with serum analytes to give individual risks of aneuploidy. In Monochorionic twins the NT is averaged and combined with serum analytes to give the same risk for both fetuses
- In triplet and higher order pregnancies aneuploidy risk is determined by the 11-14 week scan (NT +/- Nasal Bone) alone

- Discordant CRL in Monochorionic twins is associated with an increased risk of sFGR

Prenatal Diagnosis

- Results of prenatal screening need careful review and interpretation when high risk
- When an invasive procedure is planned, where possible this should be performed by a practitioner who is trained in and will be available to perform a fetal reduction if required. Sampling errors and mosaicism (mixing) has been reported in transabdominal CVS in 6-12% of cases. It is less frequent with amniocentesis with careful visualisation of the membranes
- A discordant karyotype in monochorionic twin pregnancies has been reported, for Down syndrome as well as for Turner syndrome. Even though this is rare, in monochorionic twin pregnancy with discordant phenotype sampling of both fetuses should be advised
- Some studies report an increased risk of miscarriage when sampling both twins, other studies report increased risk, up to double the risk in singletons. Therefore it seems prudent to inform patient of a procedure related risk of miscarriage of 0.6% for amniocentesis and 1.0% for chorionic villus sampling
- It seems plausible that in dichorionic twins a single punction, with protrusion of the needle through the dividing membrane after sampling of amniotic fluid from the first twin, is safe. In monochorionic twins this procedure is not considered safe, because there is an increased risk of perforation of the thin membrane with iatrogenic monoamniotic twins as a result

Suggested scanning guidelines

- Dating scan (with determination of chorionicity)
- Nuchal translucency scans
- Dichorionic Twins
  - Anatomy scan at 18 – 20 weeks
  - Biometry scans every 4 weeks with the addition of Umbilical artery dopplers if SGA. If SGA in either twin growth scans need to be done every fortnight, and in case of abnormal Umbilcial artery Doppler, scanning frequency should be increased to twice weekly. After 34 weeks scanning can be guided by the NZMFMN SGA guideline http://www.healthpoint.co.nz/public/new-zealand-maternal-fetal-medicine-network/?solo=otherList&index=4
  - If there is severely discordant growth preterm the decision can be made with the parents to refrain from intervention in case of fetal distress in the growth-restricted fetus. This management needs to be individualised in consultation with the neonatologists, counselling of the parents is needed by both neonatologist and MFM subspecialist. It should be taken into consideration that active management for the small twin may have severe negative consequences because of iatrogenic prematurity for the well-grown cotwin.
- Monochorionic Twins
  - Anatomy scan at 18-20 weeks
  - Fortnightly scans from 16 weeks gestation to include:
    - Biometry, amniotic fluid deepest vertical pool, presence/absence bladder and stomach filling, Umbilical artery Doppler.

- From 24 weeks in addition MCA PSV where possible to obtain
- In the case of fetal demise of one fetus there is a significant risk of ischemic brain damage in the surviving cotwin. Consideration should be given to MRI six weeks after the event or longer depending on the gestation

Diagnosis of TTTS

- Quintero staging based on Discordancy of Amniotic fluid
- Stage 1
  - <20 weeks Twin 1 DVP <2cm, Twin 2 DVP > 8cm
  - >20 weeks Twin 1 DVP <2cm, Twin 2 DVP > 10cm
- Stage 2 Absent Bladder in Oligohydramnios twin
- Stage 3 Critical Dopplers in either twin
  - Critical Dopplers = Umbilical artery Doppler absent or reversed
- Stage 4 Hydrops in either twin

Diagnosis of TAPS

- MCA PSV which are >1.5 MoM AND <1.0 MoM
- There is a risk of TAPS because of small anastomoses that may remain after laser coagulation (may be right at the edge of the placenta)
- http://www.perinatology.com/calculators/MCA.htm provides an online calculator

Diagnosis of sFGR

- EFW discordancy of >25% OR
- EFW of one twin < 10th centile

When to refer

Under Section 88 women with a multiple pregnancy should be under the care of a Specialist Obstetrician, though in many cases care is shared with a midwifery LMC.

A specialist with an interest in high risk pregnancy should be involved in the following situations:

- High risk first trimester screening or anomaly on anatomy scan
- Amniotic fluid discordancy
- Growth discordancy of >20% EFW

Where there is a possible diagnosis of TTTS early referral within 24 hours to the regional Fetal Medicine unit is recommended for further assessment. This condition can deteriorate quickly and treatment for severe cases is available only in Auckland.

Delivery

The timing of Birth of Twin pregnancies has been examined in a two randomised controlled trials. In the larger ARCH study conducted in Australia and New Zealand, better outcomes were observed with a policy of routine delivery at 37 weeks gestation if there was no reason to deliver prior to this.

The majority of pregnancies in these studies were dichorionic and it is recognised that monochorionic pregnancies present a higher risk. In a large retrospective review of monochorionic pregnancies outcomes were improved with delivery at 36 weeks gestation. On balance monochorionic twin pregnancies should have delivery considered at 36-37 weeks gestation.

In monoamniotic twin pregnancies there is an increased risk of fetal demise due to cord accidents. Therefore in monoamniotic twin pregnancy delivery by elective caesarean section is advised at 32 weeks, after steroids to enhance fetal (lung) maturation.

Mode of delivery in twins:

A large Canadian randomised controlled trial in 1398 women showed that in twin pregnancies between 32+0 weeks gestation and 38+6 weeks gestation with the first twin in cephalic presentation, planned caesarean delivery did not significantly decrease or increase the risk of fetal or neonatal death or serious neonatal morbidity as compared with planned vaginal delivery. The rate if caesarean section was 91% in the planned caesarean delivery group and 44% in the planned vaginal delivery group (1/3 of which were performed before labour).

If there are no contra-indications to vaginal delivery, this should take place in a setting where there is availability of fetal monitoring and rapid re-course to Caesarean section.

References

- Sepulveda W, Sebire NJ, Hughes K, Kalogeropoulos A, Nicolaides KH. Evolution of the lambda or twin-chorionic peak sign in dichorionic twin pregnancies, Obstet Gynecol. 1997;89 (3):439-41.
- Slaghekke F, Kist WJ, Oepkes D, Pasman SA, Middeldorp JM, Klumpfer FJ et al. Twin anemia-polycythemia sequence: diagnostic criteria, classification, perinatal management and outcome, Fetal Diag Ther. 2010;27(4):181-90.
- Kristiansen MK, Joensen BS, Ekelund CK, Petersen OB, Sandager P. Perinatal outcome after first trimester risk assessment in monochorionic and dichorionic twin pregnancies: a population based register based review. BJOG. 2015;122(10):1362-9
- Ong SS, Zamora J, Khan KS, Kilby MD. Prognosis for the co-twin following single twin death: a systematic review. BJOG. 2006 Sep;113(9):992-8
- Memmo A, Dias T, Mahsud-Dornan S, Papageorghiou AT, Bhide A, Thilaganathan. Prediction of selective fetal growth restriction and twin-to-twin transfusion syndrome in monochorionic twins. BJOG. 2012;119:417-421
- Dodd JM, Crowther CA, Haslam RR, Robinson JS. Elective birth at 37 weeks of gestation versus standard care for women with an uncomplicated twin pregnancy at term: the Twins Timing of Birth Randomised Trial, BJOG. 2012;118(8):964-73
- Barrett JF, Hannah ME, Hutton EK et al, for the Twin Birth Study Collaborative Group. A Randomized Trial of planned caesarean or vaginal delivery for twin pregnancy. NEJM 2013; 369(14):1295-305