Multiple pregnancy

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Definition

- When more than one foetus **simultaneously** develops in the uterus, it is called multiple pregnancy.
- Simultaneous development of two foetuses is twin, which is the commonest.
- Development of three foetuses is triplet.
- Four foetuses is quadruplets.
- Five is quintuplets.
- Six is sextupets may also occurs.

Twins

Varieties

- **Dizygotic twins**- (syn: fraternal, binovular) most common variety 80% results from fertilisation of two ova, most likely ruptured from two distinct Graafian follicles usually from the same or one from each ovary, by two sperms during a single cycle. Their subsequent implantation & development differ little from those of a single fertilized ovum. The babies bear only fraternal resemblance to each other (like brother & sisters from different births) and hence called fraternal twins.

- **Monozygotic twin** -(syn: indentical, uniovular) 20% results from fertilisation of single ovum. Here twining may occur at different periods after fertilization & this markedly influences the process of implantation and the formation of the foetal membranes.

In Monozygotic Twin

On rare occasion, following possibilities may occur:

- If division takes place within 72 hours after fertilisation (prior to morula stage) the resulting embryos will have two separate placenta, chorions and amnions (diamniotic-dichorionic or D/D -30%).
- If division takes place between the 4th & 8th days after formation of inner cell mass when chorion has already developed- (diamniotic-monochorionic twinor D/M -66%).
- If division occurs after 8th days of fertilisation, when the amniotic cavity has already developed-(monoamniotic-monochorionic or M/M -3%).
- If division takes place after 2weeks of the development of embryonic disc resulting in the formation of conjoined twin (<1%) called Siamese twin.

✦Four types of fusion may occur (i) Thoracopagus most common, (ii) Pyopagas (posterior fusion) (iii) Craniopagus (cephalic) & (iv) Ischiopagus (caudal).

Zygosity

Zygosity refers to the genetic makeup of twin pregnancy .

- Determination of zygosity: it is important during organ transplantation. With the advent of organ transplantation, the identification of zygosity of twin has assumed.

Examination of placenta & membranes

Dizygotic twins

- (i) There are two placentae, either completely separated or more commonly fused at margin appearing to be one (9 out of 10). There is no anastomosis between the two fatal vessels
- (ii) Each foetus is surrounded by a separated amnion& chorion
- (iii) As, such, intervening membranes consist of 4 layers- amnion, chorion, chorion and amnion. Infant in early pregnancy the decider capsular of each sac may be identified under the microscope in between the chorionic layers.

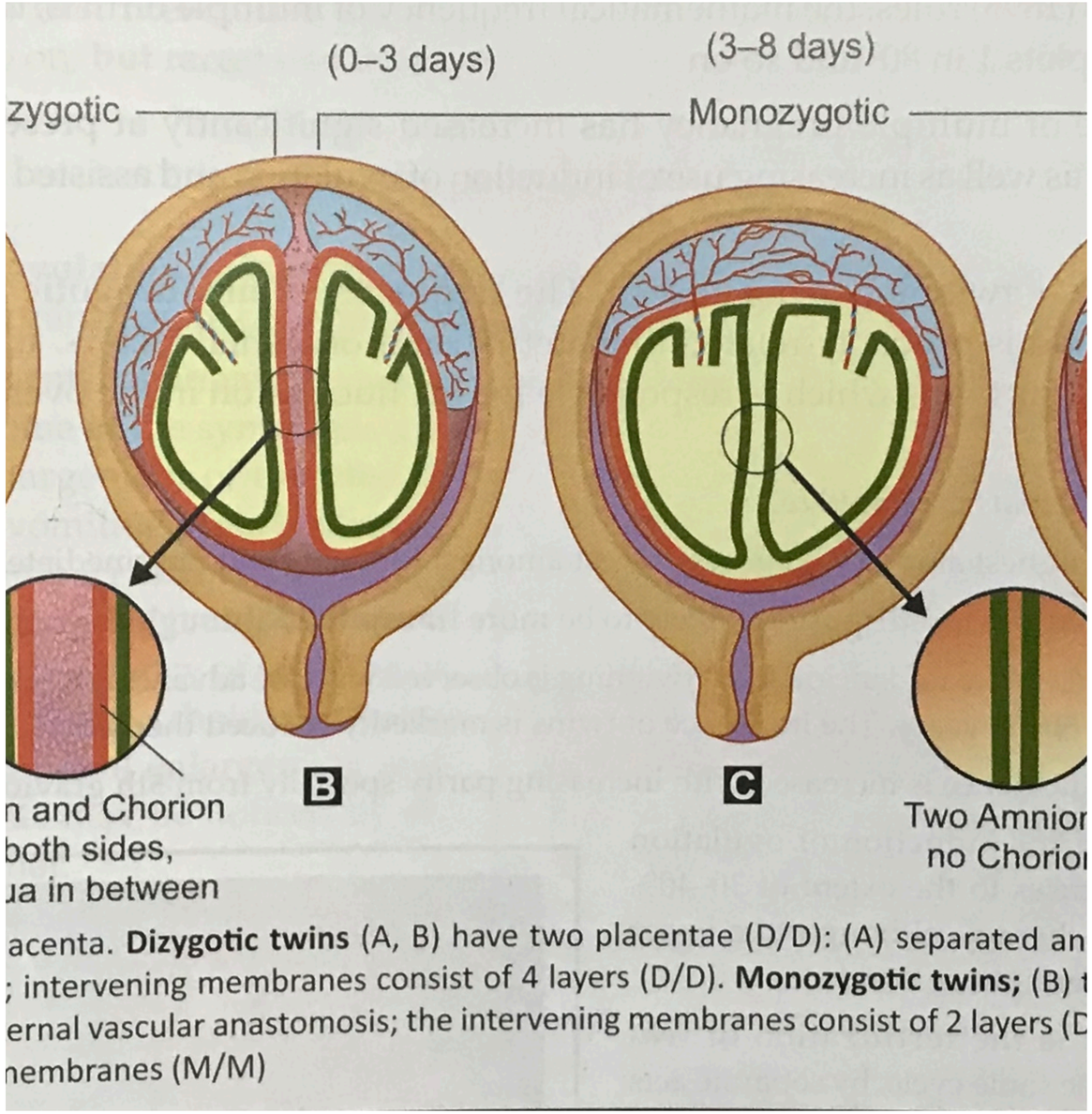
Examination of placenta & membranes

Monozygotic twin

- (i) The placenta is single. There is varying degree of free anastomosis between the two foetal vessels
- (ii) Each foetus is surrounded by a separate amniotic sac with chorionic layer common to both in D/M.
- (iii) As such the intervening membranes consist of two layers of amnion only. However, on rare occasions, the uniovular twins may be D/D OR M/M.

Twin placenta

- Dizygotic twins (A,B)- D/D
- Monozygotic twin (B) two placenta D/D
- Monozygotic twin (C)-D/M
- Monozygotic twin (D)-M/M



Difference

Between monozygotic & dizygotic twins

6.1: Summary of determination of zyg

Intervening membranes	Sex	Ger feat (do blo DN prir
2 (amnions)	Always identical	San
4 (2 amnions 2 chorions)	May differ	Diff

Determination of zygosity

- Sex: while twins having opposite sex are almost always binocular and twins of the same sex are not always uniovulars but the uniovular twins are always of the same sex.
- If the foetus are the same sex & have the same genetic features (dominant blood gruop), monozygotic is likely
- A test skin graft-acceptance of reciprocal skin graft is almost a certain proof of monozygotic.
- DNA microprobe technique is most definitive.
- Follow up study between 2-4 years-showing similar physical & behaviour features suggestive of monozygosity.

Incidence

- The incidence varies widely.
- It is the dizygotic twins which are responsible for the wide variation of the incidence.
- It is highest in Nigeria being 1 in 20 & lowest in Far Eastern countries being 1 in 200 pregnancies. In India, the incidence is about 1 in 80.
- While the incidence of monozygotic twins remains fairly constant through out the glove being 1 in 250.
- According to Hellin's rules(1895), the mathematical frequency of multiple birth is, twins 1 in 80, triplets 1 in 80º2, quadruplets 1 in 80º3 & so on.
- The actual incidence of multiple pregnancy has increased significantly at present, due to early detection by USG as well as increasing use of INDUCTION OF OVULATION & ART

Etiology

The cause of twining is not known. The frequency of monozygosity remain constant throughout the globe.

- Prevalence of dizygotic twins is related to:
- Race: highest amongst Negroes, lowest amongst Mongols & intermediate amongst Caucasians.
- Hereditary: predisposition likely to be more transmitted through the female maternal side.
- Advancing age of the mother: increase incidence of twining is observed with the advancing age of the mother, the maximum being between the age of 30-35 years, incidence marked reduce thereafter.
- Influence of the parity: increased with increasing parity specially from the 5th gravid onwards.
- Iatrogenic: drug used for ovulation induction produce multiple foetus 20-40% following gonadotropin therapy & 5-6% following Clomephene citrate.

- Superfecundation
- Superfetation
- Foetal papyraceous or compresses
- Foetus acardiacus
- Hydatidiform mole
- Vanishing twin

Foetal papyraceous

- Missed abortion & momification.
- Due to momification reduce chance of DIC

Fig. 16.2: Fetus papyraceous or compressus

Maternal physiological changes

Multiple pregnancy imposed physical changes on the mother in excess of those seen in singleton pregnancy

(1) There is increase in weight gain &cardiac output

(2)Plasma volume is increases by addition of 500 ml. There is no corresponding increase in red cell volume resulting in exaggerated hemodilution & anaemia.

(3)There is increase **α** fetoprotein level, tidal volume & glomerular filtration rate.

Lie and presentation

The most commonest lie is longitudinal 90%

- The combination of the foetus are

➡ (1) Both vertex (50%)

➡ (2) First vertex and second breech (30%)

➡ (3) First breech and second vertex (10%)

➡ (4) Both breech (10%)

➡ (5) First vertex and second transverse lie and so on,

◉ But rarest one is being both transverse when there possibility of conjoined twins should be ruled out.

Diagnosis

- History :
- (i) H/O ovulation inducing drugs specially gonadotropins, for infertility or use of ART.
- (ii) Family history of twining (more present in the maternal side).
- Symptom :exaggerated S/S of pregnancy ,some are related to undue enlargement of the uterus
- Increase nausea & vomiting in early months
- Cardiorespiratory embarrassment which is evident in the later months such as palpitation or shortness of breath
- Tendency of swelling of the legs, varicose veins & haemorrhoids is greater
- Unusual rate of abdominal enlargement & excessive foetal movements may be noticed by an experienced porous mother.

Clinical examination

- **General examination:** (i) Prevalence of the anaemia is more than in singleton pregnancy. (ii) Unusual weight gain, not explained by preeclampsia or obesity, is an important feature (iii) Evidence of preeclampsia (25%) is common association.
- **Abdominal exam:** palpation & auscultation is not carried out easily due to hydramnios.
- **Inspection:** the elongated shape of normal pregnant uterus is changed to more “barrel shape” & abdomen unusually enlarged.
- **Palpation:**(i) The height of the uterus is more than the period of amenorrhoea. The discrepancy may only become evident from mid-pregnancy onwards. (ii) The girth of the abdomen at the level of umbilicus is more than the normal average at term(100 cm). (iii) Foetal bulk seems disproportionately larger in relation to the size id the foetal head. (iv) Palpation of too many foetal parts. (v) Finding of two foetal head or there foetal poles make the clinical diagnosis almost certain.
- **Auscultation:** simultaneous hearing of two distinct foetal heart sounds located at separate spots with a silent area in between by two observes, gives a certain clue in the diagnosis of twins, provided the difference in heart rates is rates is at least 10 beats per minutes.

- **Internal exam:** in some cases, one hand is felt deep o the pelvis, while other hand is located by abdominal examination.
- On occasions, the clinical methods fail to detect twins prior to the delivery of the baby.
- **Investigations :**
  - **USG:** in multi-foetal pregnancy it is done to obtain the following information: (i) Confirmation of diagnosis as early as 10 th week of pregnancy. (ii) Viabilility of foetuses, vanishing twin in the second trimester. (iii) Chorionicity (lambda or twin peak sign). (iv) pregnancy dating. (v) Foetal anomalies. (vi) Foetal growth monitoring (at ever 3-4 weeks interval) for IUGR. (vii) Presentation & lie of the foetuses. (viii) Twin transfusion (Doppler studies). (ix) Placental localisation. (x) Amniotic fluid volume.
  - **Biochemical tests:** Maternal serum chorionic gonadotrophin, α fetoprotein & unconjugated estriol are approx. double than singleton. But their values cannot diagnosed clearly a twin from a single foetus.

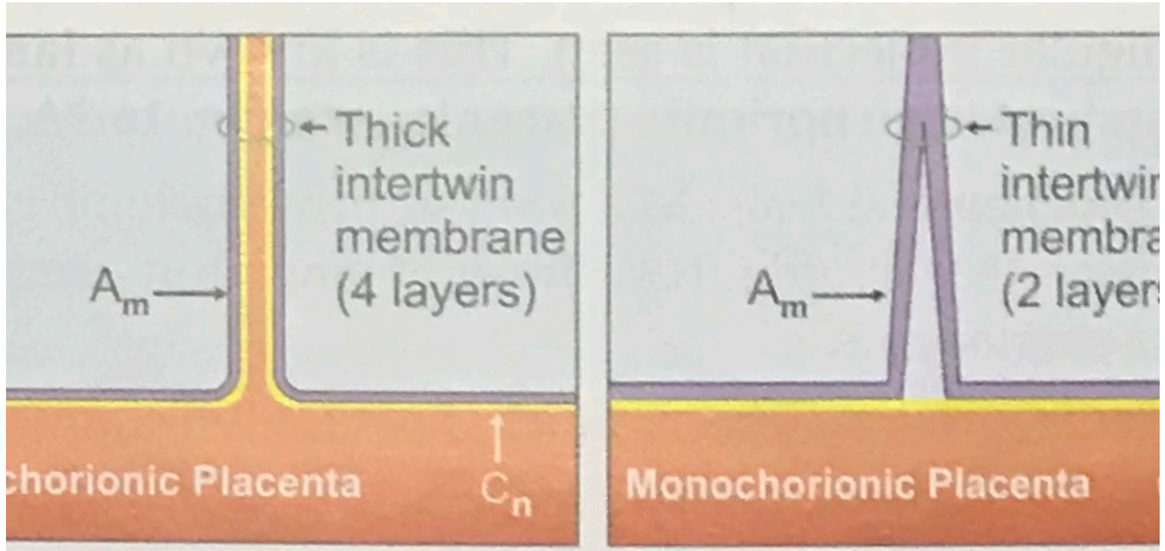
USG -colour doppler TVS

- Chronicity of the placenta is best diagnosed by USG at 6-9 weeks of gestation.
- In dichorionic twin, there is a thick septum between the chorionic sacs. Identified at the base of the intertwine membrane (twin peak sign) of dichorionic, diamniotic placenta (D/D) is seen.
- Presence of lambda or twin peak sign indicates dichorionic placenta.

Fig. 16.3C: Color Doppler Scan (TVS) showing twin pregnancy. Thick intertwin membrane **(twin peak sign)** of dichorionic, diamniotic placenta is seen

“Twin peak” sign

- It appears as a triangle with the base at the chorionic surface & the apex in the intertwin membrane.



ig. 16.3A and B: (A) **“Twin peak”** sign. In dichorion
iamniotic twin gestations, the chorion and amnion for ea
vin reflect away from the fused placenta to form the **intertw**
embrane. A potential space exists in the intertwin membran
hich is filled by proliferating placental villi giving rise to the **tw**
eak sign. Twin peak sign appears as a triangle with the base
e chorionic surface and the apex in the intertwin membran
3) **In monochorionic, diamniotic twins**, the intertw
embrane is composed of two amnions only (A_m = Amnio
$_n$ = Chorion). (See Fig. 16.1)

Complications

Maternal & foetal

- Maternal

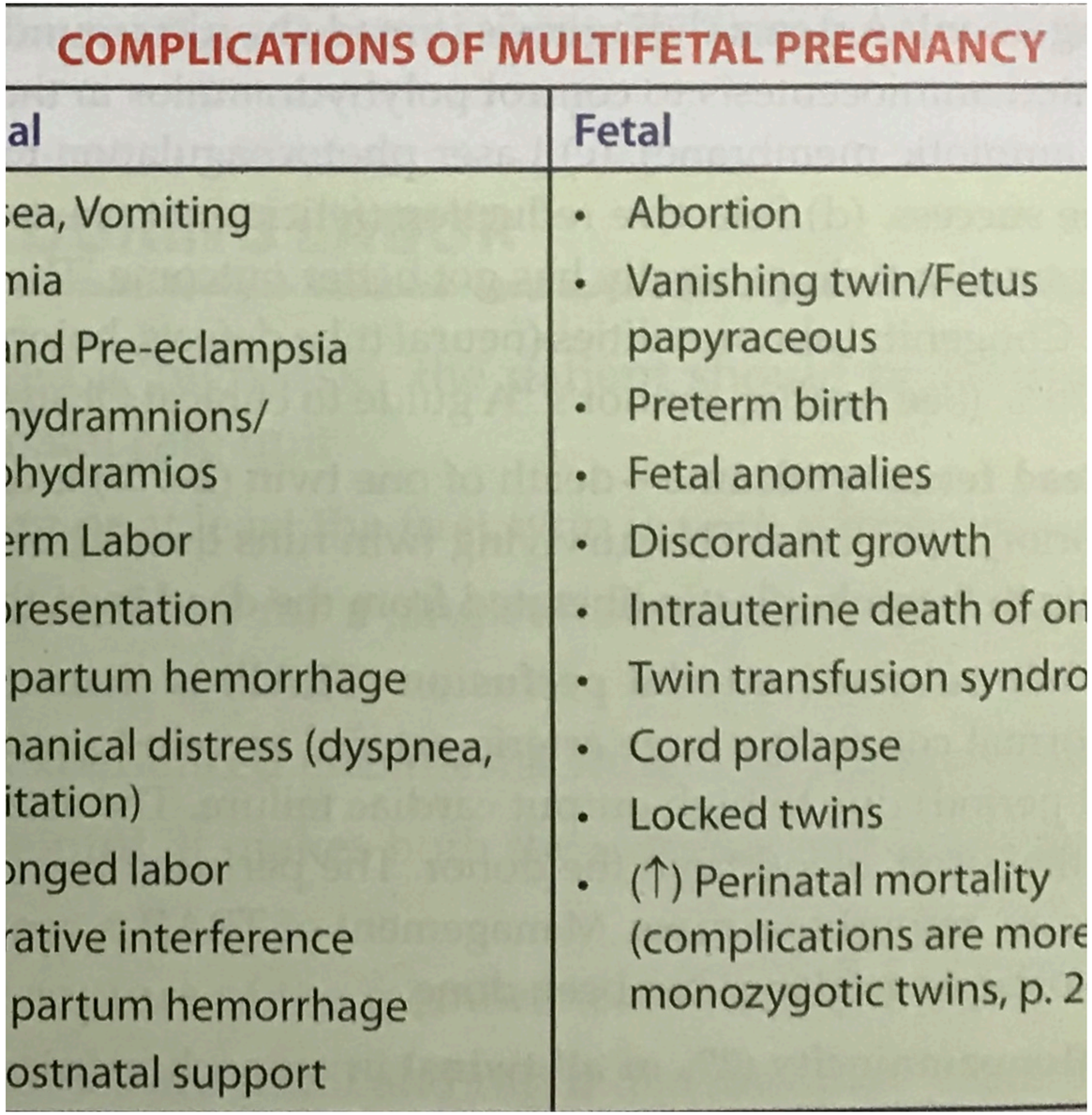
➡Frist trimester

➡Second trimester

➡Third trimester

➡Intrapartum /in labour

➡Post partum/ puerperium



COMPLICATIONS OF MULTIFETAL PREGNANCY	
al	Fetal
ea, Vomiting mia nd Pre-eclampsia ydramnions/ hydramios rm Labor resentation partum hemorrhage hanical distress (dyspnea, itation) nged labor rative interference partum hemorrhage ostnatal support	• Abortion • Vanishing twin/Fetus papyraceous • Preterm birth • Fetal anomalies • Discordant growth • Intrauterine death of on • Twin transfusion syndro • Cord prolapse • Locked twins • (↑) Perinatal mortality (complications are more monozygotic twins, p. 2

Prognosis

- **Maternal mortality:** is increased in twins than in a singleton pregnancy. Death is mostly due to haemorrhage (before, during & after delivery), preeclampsia & anaemia. Increased maternal morbidity is due to the prevalence of complications & increased operative interference.
- **Perinatal mortality:** is markedly increased mainly due to prematurity. It is 4-5 times higher than in a singleton pregnancy. It is extremely high in monoamniotic monozygotic twins due to cord entanglement. One third loss is due to stillbirth & two third due to neonatal death. During delivery the second baby is more at risk (50%) than the 1st one due to -
- (i) Retraction of uterus leading to placental insufficiency
- (ii) Increases incidence of the cord prolapse.
- Because of increased risk to both the mother & the babies, compare to a singleton, the twin pregnancy is considered ‘high risk’ & should be delivered in a hospital.

Complications of monochorionic twin

- Twin-twin transfusion syndrome (TTTS)
- Dead foetus syndrome- (2-7% death of one twin with poor outcome of cotwin)
- Twin reverse arrival perfusion (TRAP)
- Monoamniocity (2% of all twins)
- Conjoined twin

Management

Antenatal management

- Make an early diagnosis
- USG exam are the keys to the diagnosis. Need to detect chronicity, amniocity, foetal growth pattern & congenital malformations.
- **Advice:**
  - **Diet** extra 300 Kcalper day, over & above that needed in a singleton with increased protein diet
  - Increased **rest** at home & early cessation of work is advised to prevent preterm labour & other complications
  - **Supplement therapy:** Iron therapy 100-200 mg per pay, additional vitamins, calcium& folic acid
  - Interval of **antenatal visit** should be frequent to detect earliest, the evidence of its complication
  - **Foetal surveillance** is maintained by serial USG at every 3-4 weeks interval.Assessment of foetal growth, amniotic fluid volume & AFI, non-stress test & Dopplar velocimetry are carried out.

Cont

Hospitalisation

- Routine : hospital admission only for bed rest is not essential. Bed rest even at home from 24 weeks onwards, not only ensures physical & mental rest but also improves uteroplacental circulation. This results in (i) increased birth weight of the babies, (ii) decreased frequency of preeclampsia (iii) prolongation of the duration of pregnancy.

- To prevent preterm delivery, routine use of betamimetisc or circle operation has got no significant benefit. Use of corticosteroids to accelerate foetal lung maturation is given to women with preterm labour < 34 weeks. Twin develop pulmonary maturity 3-4 weeks earlier than singletons.

- Emergency: development of complicating factors necessitates urgent admission irrespective of the period of gestation.

Management during labour

- Place of delivery: in an equipped hospital with neonatal ICU facilities.
- Vaginal delivery is allowed when both twins are or at least the first twin vertex presentation.
- First stage: usual conduction of the stage as outlined for a singleton foetus, is to be followed with additional precautions:
  - A skilled obstetrician should be present with an experienced anaesthetist.
  - Presence of USG in the labour ward is helpful for external & internal version
  - Prevent early rupture of membrane ensure bed rest.
  - Use of analgesics is to be limited as the babies are small & rapid delivery may occur. Epidural analgesia is preferred as it facilities manipulation of 2nd foetus.
  - Careful foetal monitoring with CTG.
  - P/V done soon after PROM to exclude cord prolapse.
  - I/V line with Ringer’s solution should be set cup for any urgent I/V therapy, if required.
  - One unit of compatible & cross matched blood should be made readily available.
  - Neonatologist should be present at the time of delivery.

Delivery of the first baby

- Same guideline as normal delivery.
- Usually the baby is small so not usually pose any problem.
- Should give -

- (i) Libaral episiotomy under L/A.
- (ii) Forceps delivery if needed under pudendal block.
- (iii) never use ergometrine before delivery of 1st baby.
- (iv) Clamp cord cut as usually.
- (v) At least 8-10 cm cord is left behind for any drug administration or blood transfusion, if required.
- (vi)The baby is handed over to the nurse after labelling it as 1st baby or No. 1.

Conduction of labour after delivery of 1st baby

- Principles: is to expedite the delivery of the second baby. The 2nd baby is put under strain due to placental insufficiency caused by the uterine retraction following birth of the 1st baby.
- Step of management:-
- Step -1. Following the birth of the 1st baby, the lie, presentation, size & FHS of the second twin should be ascertained. P/V should be done to confirm the abd findings and exclude PROM & cord prolapse.
- In longitudinal lie - low rupture of membrane after fixing the presenting part on the brim. Syntocinon may be added to infusion bottle to achieved this. P/V once again to exclude cord prolapse and foetal condition should be monitor.
- Step -II: if ut contraction is poor then start oxytocin infusion. Interval between delivery should be less than 30 min
- Step -III: if delay then interference is to be done- Vextex - low down Forceps are applied.

-high Up - CPD should br ruled out. Ventouse or internal podalico version (IPV) with breech extraction under GA.

- Breech - breech extraction
- Transverse lie: it should be corrected by external cephalic version (ECV) into longitudinal lie, separably cephalic if failed podalic

Indication of urgent delivery of 2nd twin

1. Severe intrapartum vaginal bleeding
2. Cord prolapse of 2nd twin.
3. Inadvertent use of I/V egometrin with the delivery of ant shoulder of 1st baby
4. First baby delivery under GA
5. Appearance of foetal distress.

Cont

Management : in all case the baby should be delivered quickly. Scheme depend on the lie, presentation, position & station of the head and FHR

A.Head -if **low down** , delivery by Forceps, if **high up** then by internal version under GA

B.Breech -should be delivered by breech extraction.

C.Transverse lie - internal version followed by breech extraction under GA

If , however, the patient bleeds heavily following the birth of the first baby, immediate low rupture of the membranes usually succeed in controlling the blood loss.

✤Delayed delivery of the second twin have been recorded from **21 to 143 days.** Delayed may be associated with perinatal death and maternal mortality.

Management of third stage

- The risk of postpartum haemorrhage can be minimised by routine administration of 0.2 mg methergin I/V or oxytocin 10 IM with the delivery of the anterior shoulder of the second baby.
- The placenta should be delivered by controlled cord traction. A blood loss of than average should be immediately replaced by blood transfusion, already kept at hand.
- The patient is to be carefully watched for 2 hours after delivery.
- Multiple birth puts an additional stress & strain on the mother as well as on the family members.
- Chance of lactational failure is more.

Indication of caesarean section

Divided into two - obstetric cause & for twins

- Obstetric indication

1. Placenta Praevia
2. Severe preeclampsia
3. Previous caesarean section
4. Cord prolapse of 1st baby
5. Abnormal uterine contraction
6. Contracted pelvis.

Cont

- For twins

1. Both the foetuses or 1st foetus with non cephalic presentation
2. Twin with complications: IUGR, Conjoint twins,
3. Monoamniotic twins
4. Monochorionic twins with TTS
5. Collision of the heads at brim preventing engagement of either head.

   1st baby breech and 2nd baby cephalic there will be locked twin or interlocking.

Twin -twin transfusion syndrome
(TTTS)

- Is is a clinicopathological state, exclusively met with in **monozygotic twins,** where one twin appears to bleed into the other through some kind of placental vascular anastomosis. Clinical manifestations of twin transfusion syndrome occur when there is haemodynamic imbalance due to unidirectional deep arteriovenous anastomoses. As a result the **receptor** twin becomes l**arger with hydramnios, polycythemic, hypertensive and hypervolemic.** The **donar** twin may appear “stuck” due to severe oligohydramnios. Difference of haemoglobin concentration between the two, usually exceed 5 gm% & estimated foetal weight discrepancy is 25% or more.

Cont

- Management : antenatal diagnosis is made by USG with doppler blood flow study in the placental vascular bed. (a) Repeated amniocentesis to control polyhydramnios in the recipient twin. (b) Septostomy (making a hole in the dividing amniotic membrane). (c) Laser photocoagulation to interrupt the anastomotic vessels on choroonic plate can give some success. (d) Seletive reduction (foeticide) of one twin is done when survival of both foetuses is at risk. The smaller twin has better outcome. The plethoric twin is runs the risk of congestive cardiac failure & hydros. Congenial abnormalities (nural tube defect, holoprosencephaly) are high (2-3 times). Perinatal mortality in TTTS is 70%.

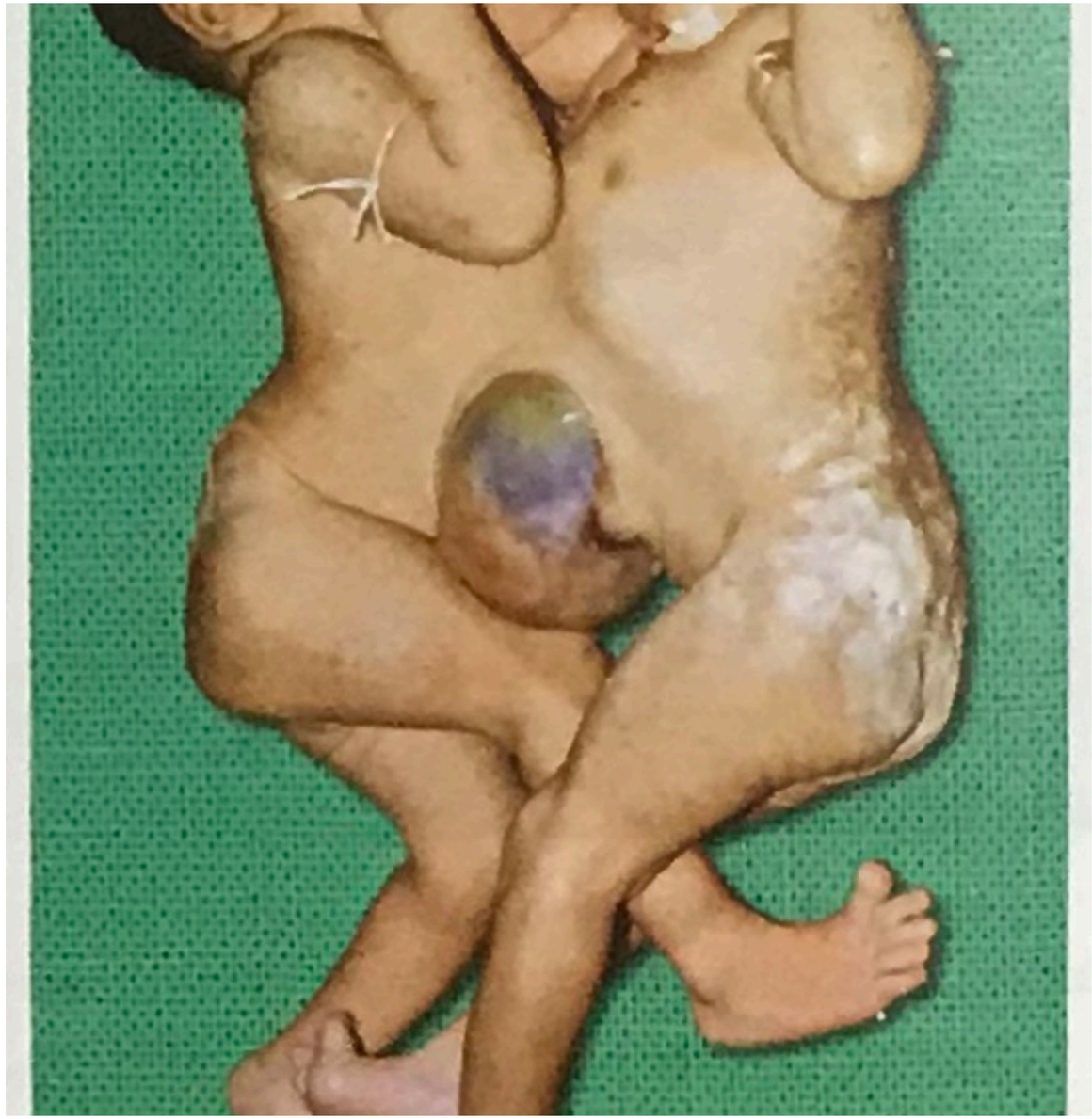
Others complications of monozygotic twin

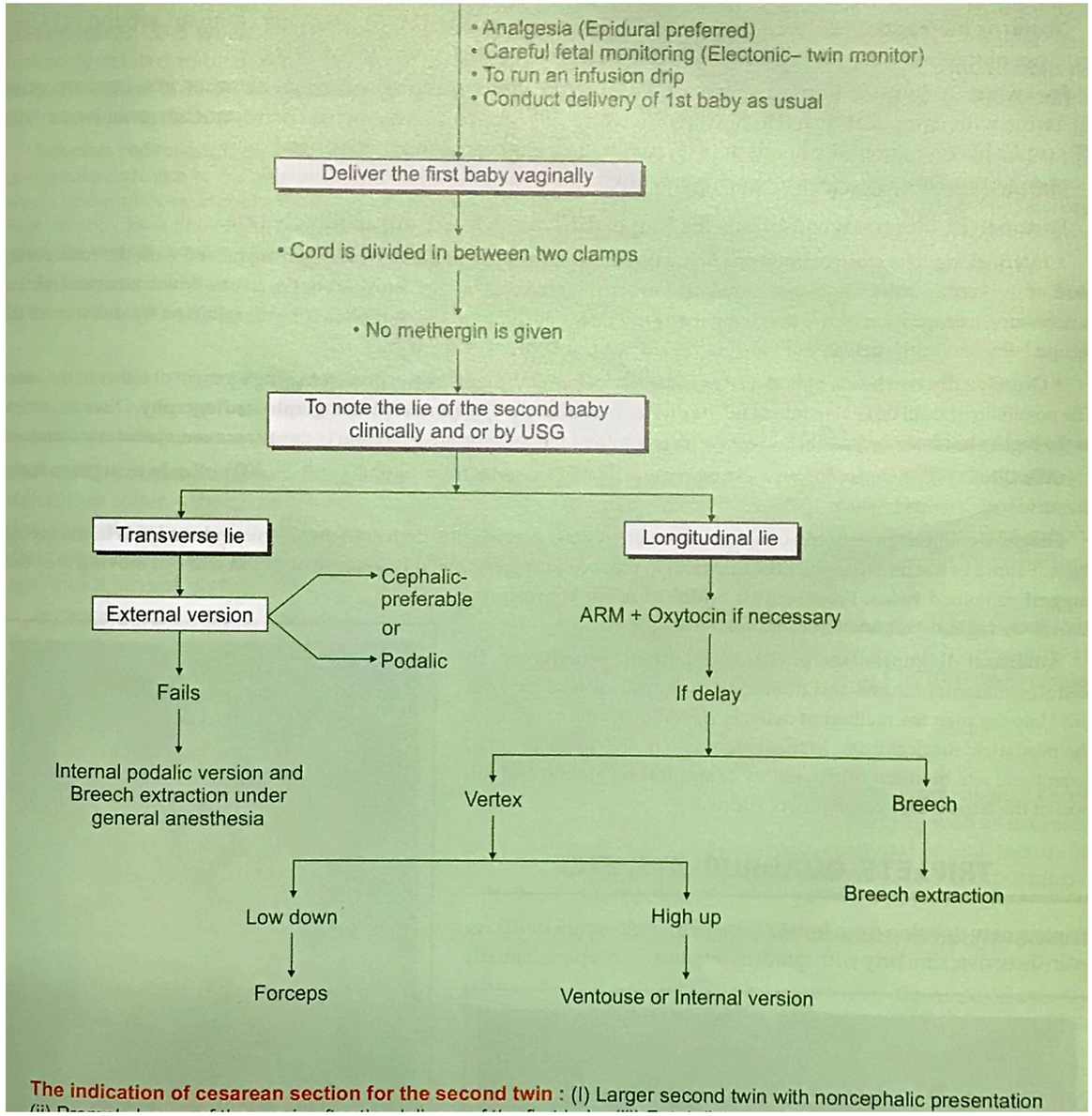
- Dead foetus syndrome also known as single foetal demise
- Twin reverse arterial perfusion (TRAP)- ‘Acardiac perfused twin’
- Monoamniocity
- Conjoined twin

Conjoined twin

Xiphopagus or omphalopagus in put

- It is very rare (1.3/100,000 births). Perinatal survival depends upon the type of joint. Major cardiovascular connection leads to high mortality.
- Management : caesarean section offers best chance of foetal survival as conjoined twins can be surgically separated. It is commonly done when the diagnosis is made during pregnancy. Preterm labour often results in vaginal delivery as the foetus are small and the point of union permits some mobility. In dead foetus evseration or amputation of the baby parts may needed.
- If it is diagnosed in 2nd trimester then termination by induction





The indication of cesarean section for the second twin : (I) Larger second twin with noncephalic presentation

Triplets

It may dev from fertilisation of single, 2 or even 3 ovum

- The diagnosis is accidental following USG or during birth. Perinatal loss is markedly increased due to prematurity. Discordance of foetal growth is more than twins. Management is similar. Average tome of delivery is 30-31 weeks. Planed for selective reduction for better outcome. Done by intracardiac inj of potassium chloride between 11-13wk under USG.

ig. 16.5A: Ultrasonographic diagnosis of a triplet pregna

The End

Thank you all