IN THE NAME OF GOD

بانی- عضو هیئت علمی دانشگاه علوم پزشکی تبریز

Shoulder dystocia

Key earning points

Antenatal and intrapartum risk factors.

- Understand manoeuvres required to effect delivery during shoulder dystocia.
- Clear and accurate documentation.
- Awareness of potential complications of shoulder dystocia.

Common difficulties observed in trainning drills

- Not calling the neonatologist.
- Not clearly stating the problem.
- Inability to gain appropriate internal vaginal access.
- Confusion over internal rotational manoeuvres,
- Resorting to traction to effect delivery.
- Use of fundal pressure instead of suprapubic pressure.

Introduction

- **Definition**
- **Incidence**
- **Pathophysiology**

Risk factors for shoulder dystocia

Prelabour	Intrapartum
Previous shoulder dystocia	Prolonged first stage
Macrosomia	Prolonged second stage
Maternal diabetes mellitus	Labour augmentation
Maternal obesity	Instrumental delivery

Previous shoulder dystocia

Previous shoulder dystocia is a risk factor for recurrent shoulder dystocia.
The recurrence rate of shoulder dystocia is reported to be at least 10% .However, this may be an underestimate, as women who have had shoulder dystocia in a previous delivery may have opted for caesarean section in their subsequent pregnancies.

Macrosomia

Large fetal size increases the risk of shoulder dystocia: the greater the fetal birth weight, the higher the risk of shoulder dystocia. A review of 14721 births reported rates of shoulder dystocia in non-diabetic mothers of: 1 % in infants weighing less than 4000 g, 10% in infant weighing 4000-4499 g and 23% in infants weighing more than 4500 g.4 However, macrosomia remains a weak predictor of shoulder dystocia. The large majority of infants with a birth weight of greater than 4500 g do not develop shoulder dystocia and up to 50% of cases of shoulder dystocia occur in infants with a birth weight less than 4000 g.5,6 Furthermore, antenatal detection of macrosomia is poor: third-trimester ultrasound scans have at least a 10% margin for error of actual birth weight and detect only 60% of infants weighing over 4500 g.

Maternal diabetes mellitus

Maternal diabetes increases the risk of shoulder dystocia. For the same birth weight, infants of mothers with diabetes have a three to four times greater risk of shoulder dystocia compared with infants of mothers without diclbetes.This is probably due to the different body shape of babies of diabetic mothers

Instrumental delivery

There is a higher rate of shoulder dystocia following instrumental delivery than with normal vaginal delivery.

Obesity

Women with a raised body mass index (BMI) are at higher risk of shoulder dYstocia than women with a normal BMI. However,women who are obese tend to have larger babies and the association between maternal obesity and shoulder dystocia is therefore likely to be due to fetal macrosomia,rather than the maternal obesity itself.

Shoulder dystocia key points

- The majority of cases of shoulder dystocia occur in women with no risk factors.
- Shoulder dystocia is therefore an unpredictable and largely unpreventable event.
- Clinicians should be aware of existing risk factors but must always be alert to the possibility of shoulder dystocia with any delivery.

Prevention

- **Shoulder dystocia can only be prevented by caesarean section. However,even in the presence of suspected fetal macrosomia, elective caesarean section is not recommended as a method of reducing potential morbidity from possible shoulder dystocia.**
- **It has been estimated that an additional 2345 caesarean deliveries would be required to prevent one permanent injury from shoulder dystocia.?**

The only clinical circumstance:

- **when elective caesarean section is recommended is for women with diabetes and suspected fetal macrosomia or**

- **where the estimated fetal weight is greater than 5 kg in a woman without diabetes. This is because of the higher incidence of shoulder dystocia and brachial plexus injury in this subgroup.**

Management

- Recognition of shoulder dystocia
- There may be difficulty with delivery of the face and chin.
- When the head is delivered, it remains tightly applied to the vulva.
- The chin retracts and depresses the perineum - the 'turtle-neck' sign.
- The anterior shoulder fails to deliver with routine traction

Call for help

- Use the emergency buzzer (not the call bell).
- Call for:
  senior midwife additional midwifery staff
  most experienced obstetrician available
  neonatologist.
- Remember to call for the neonatologist - this is often forgotten during attempted delivery.
- Consider calling the obstetric consultant and an anaesthetist.

Clearly state the problem. Announce 'Shoulder dystocia' as help arrives.
Note the time the head was delivered (start the clock on the resuscitaire or mark CTG, if monitoring).
Ask the mother to stop pushing. Pushing should be discouraged, as it may increase the risk of neurological and orthopaedic complications and will not resolve the dystocia

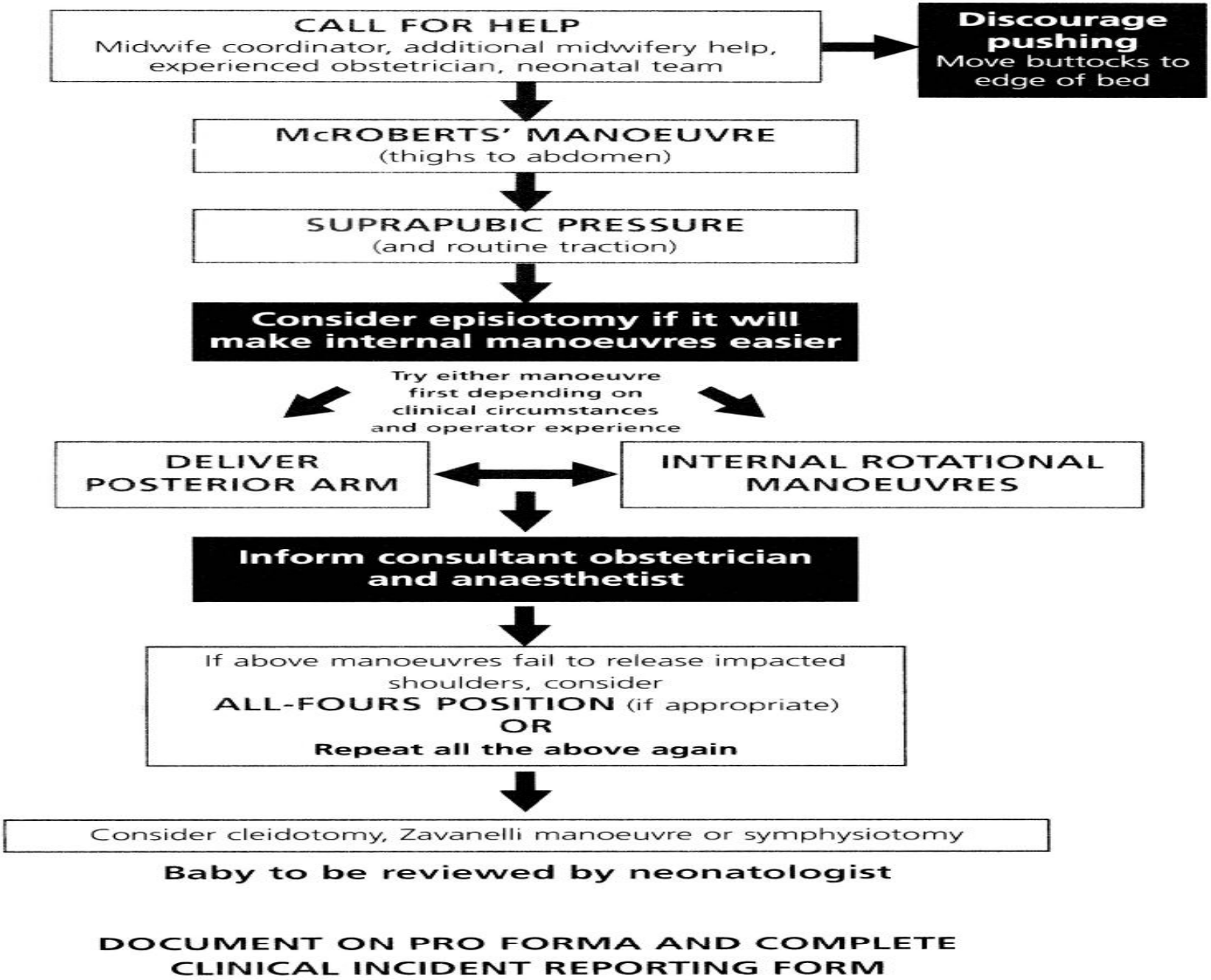


Figure 7.1. Algorithm for the management of shoulder dystocia

McRoberts' manoeuvre

Lie the mother flat and remove any pillows from under her back.

Bring her to the end of the bed or remove the end of the bed to make vaginal access easier.

With one assistant on either side, hyperflex the mother's legs against her abdomen so that her knees are up towards her ears.

If the mother is in the lithotomy position, her legs will need to be removed from the supports to achieve McRoberts' positioning.

Routine traction (the same degree of traction applied during a normal delivery) should then be applied to the baby's head to assess whether the shoulders have been released.

If the anterior shoulder is not released with McRoberts' position, move on to the next manoeuvre.

Do not continue to apply traction to the baby's head.

- **Remember: shoulder dystocia is a 'bony problem' where the baby's**
- **shoulder is obstructed by the mother's pelvis. If the entrapment is not released by McRoberts' position, another manoeuvre (not traction) is required to free the shoulder and achieve delivery.**

McRoberts' manoeuvre

- McRoberts' position increases the relative anteroposterior diameter of the pelvic inlet by rotating the maternal pelvis cephaloid and straightening the sacrum relative to the lumbar spine.
- McRoberts' position is the single most effective intervention in shoulder dystocia management with reported success rates between 40% and 90%.
- McRoberts' position is not recommended as a prophylactic manoeuvre in anticipation of shoulder dystocia.

Figure 7.2 McRoberts' position

Suprapubic pressure

- The aim of suprapubic pressure is to reduce the diameter of the fetal shoulders (the bisacromial diameter) and rotate the anterior shoulder into the wider oblique angle of the pelvis. The shoulder is then free to slip underneath the symphysis pubis .

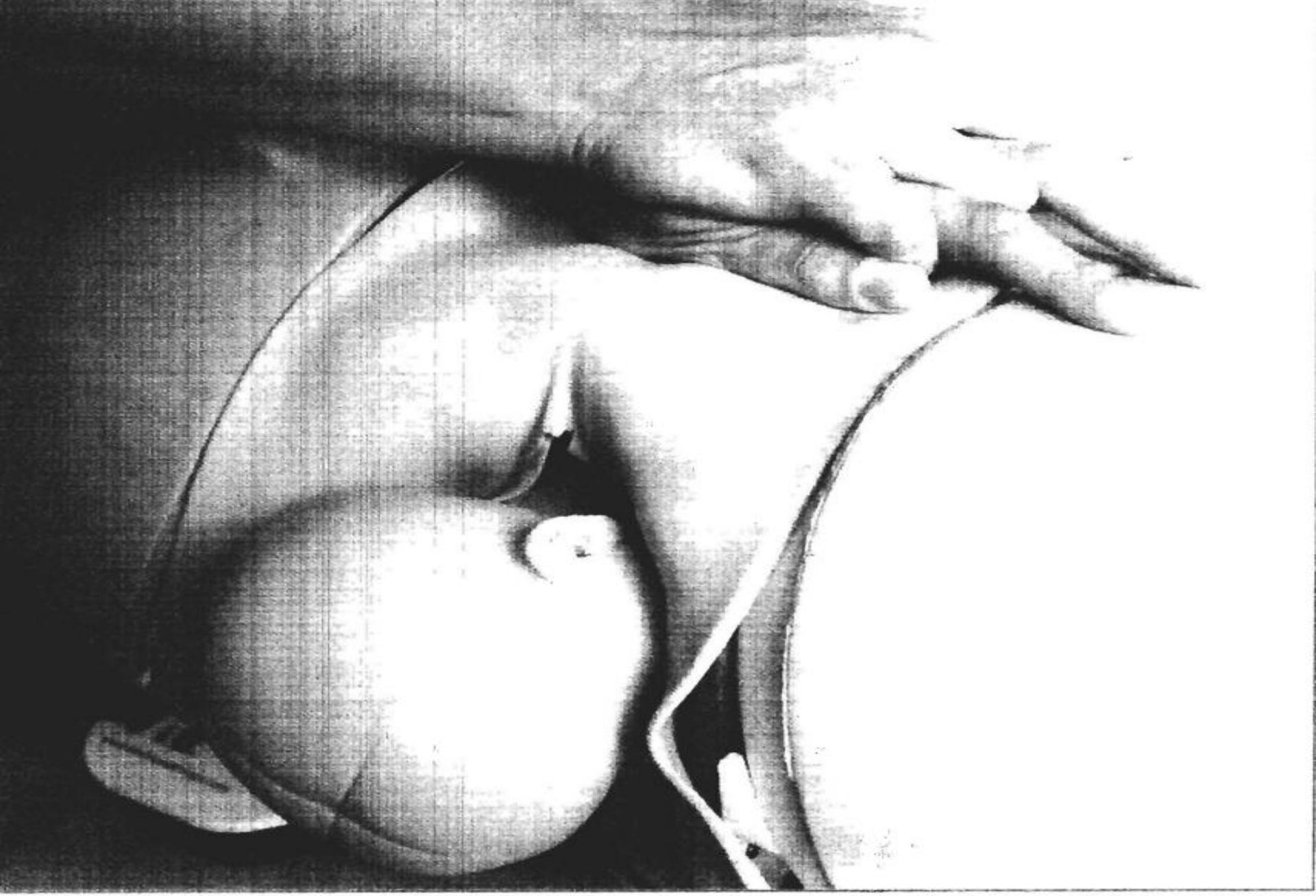


Figure 7.3. Applying suprapubic pressure

- **Evaluate the need for an episiotomy**
- **Internal manoeuvres**
- **Gaining internal vaginal access**
- **Delivery of the posterior arm**

Evaluate the need for an episiotomy

An episiotomy will not relieve the bony bstruction of shoulder dystocia but may be required to allow the accoucheur more space to facilitate internal vaginal manoeuvres.

However,there may be enough room to gain internal access without performing an episiotomy.

Often the perineum has already torn or an episiotomy may have already been performed before delivery of the head.

Internal manoeuvres

There are two categories of internal vaginal manoeuvres that can be performed if McRoberts' position and suprapubic pressure have not been effective:
internal rotational manoeuvres and delivery of the posterior arm .
There is no evidence demonstrating that either is superior or that one should attempted before the other but all internal manoeuvres start with thesame action - inserting the whole hand posteriorly into the sacral hollow.

Gaining internal vaginal access

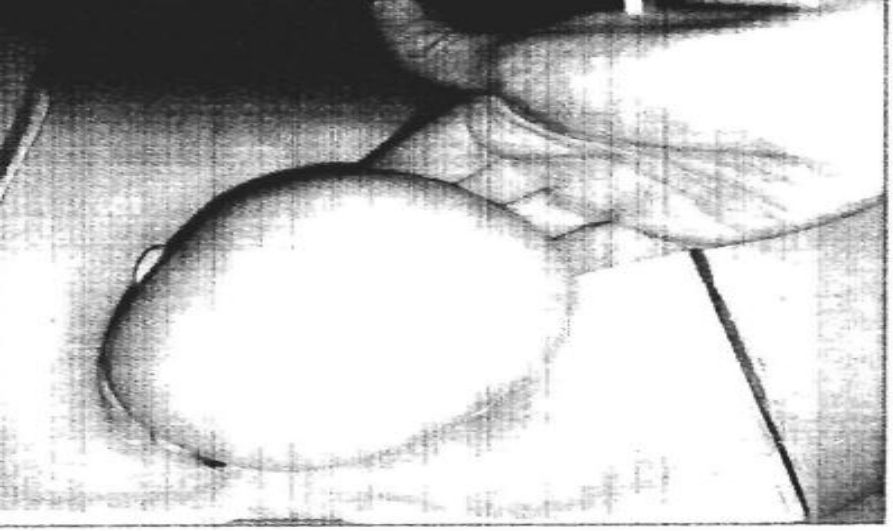
When shoulder dystocia occurs, the problem is usually at the inlet of the pelvis, with the anterior shoulder trapped above the symphysis pubis.

The temptation, therefore, is to try to gain vaginal access anteriorly to perform manoeuvres.

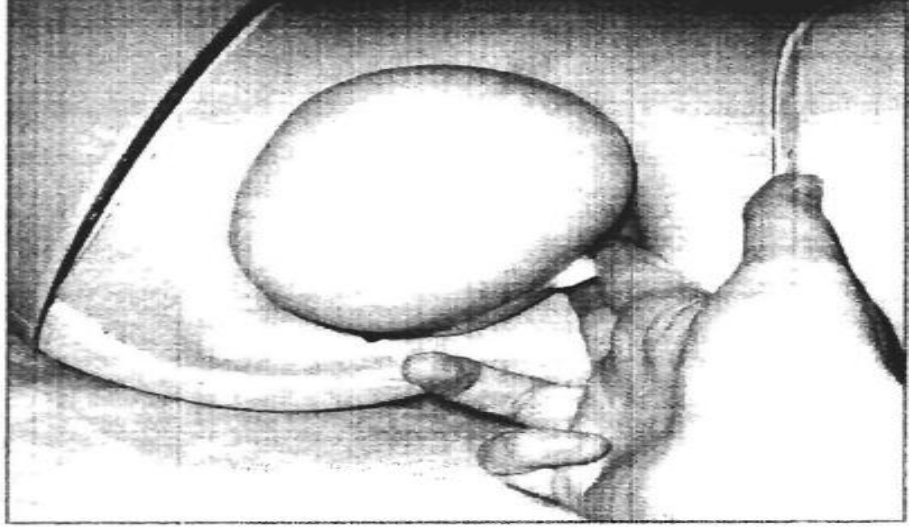
However, there is very little room underneath the pubic arch and therefore attempting any manoeuvre can be extremely difficult The most spacious part of the pelvis is in the sacral hollow; therefore va ginal access can be gained more easily posteriorly, into the sacral hollow.

If the accoucheur scrunches up their hand (as if putting on a tight bracelet or reaching for the last Pringle crisp in the bottom of the container),internal rotation or delivery of the posterior arm can then be attempted uSing their whole hand.

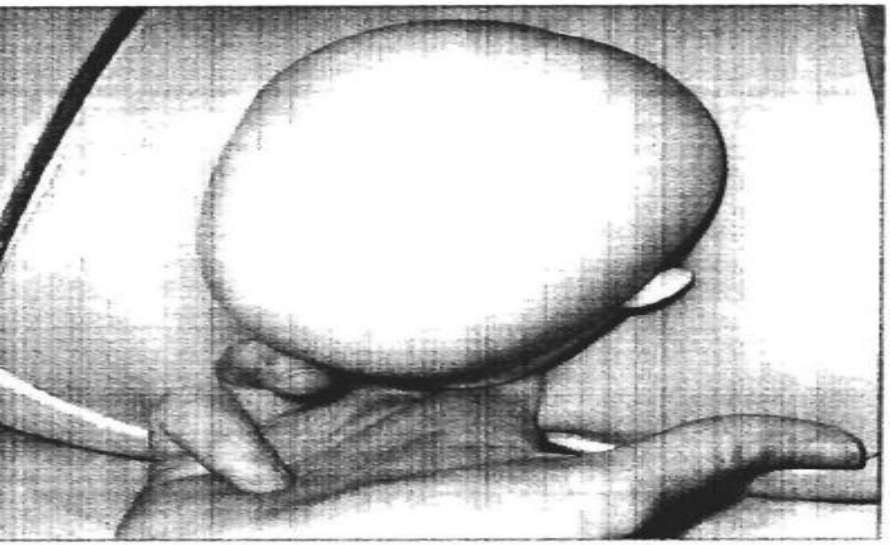
Remember to ask for suprapubic pressure to be stopped while you gain internal vaginal access.



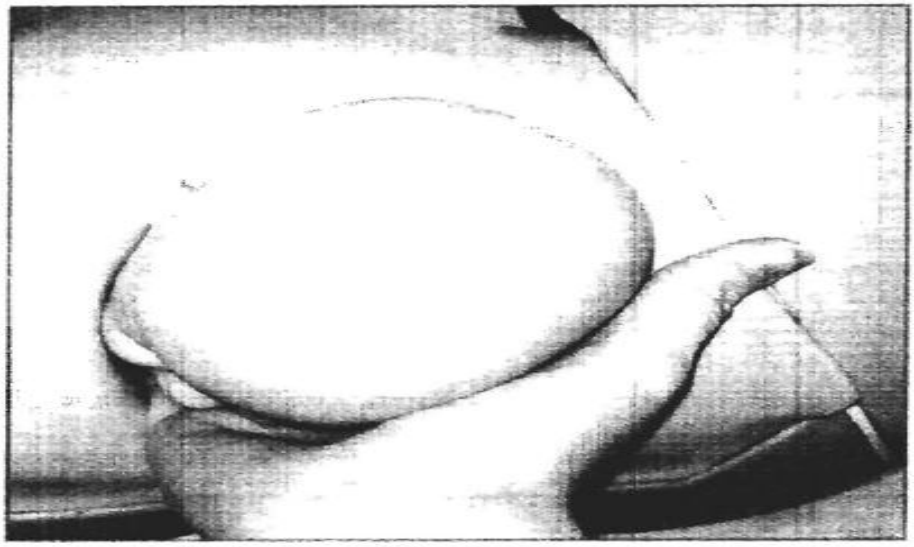
a. Attempting to gain anterior access



b. Attempting to gain lateral access



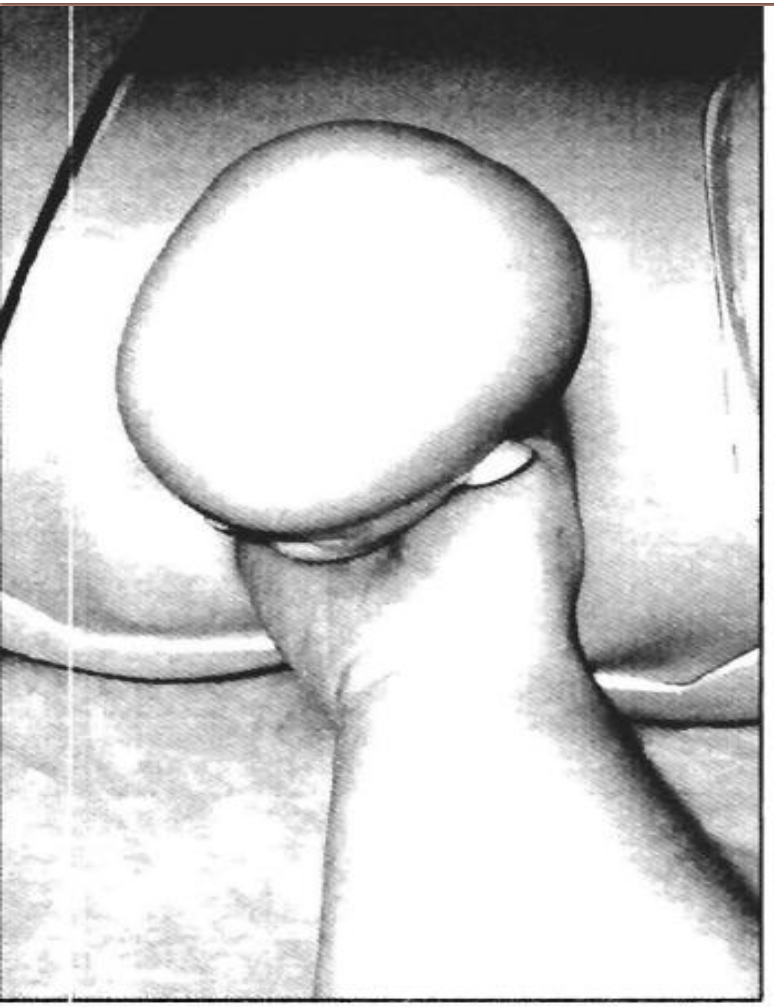
c. Entering the vagina with two fingers as if performing a routine vaginal examination



d. Leaving the thumb out of the vagina

Figure 7.4. Incorrect attempts at gaining vaginal access

Internal rotational manoeuvres



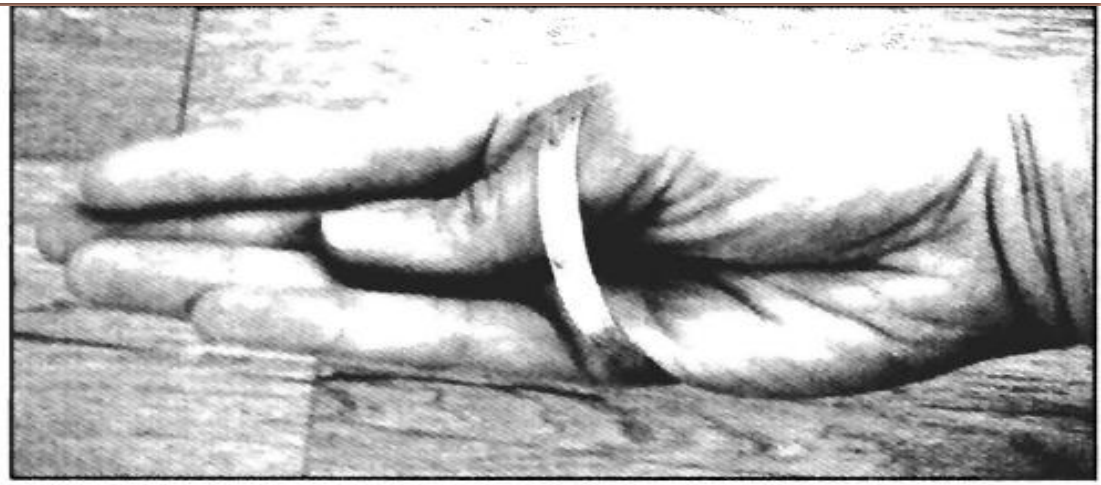


Figure 7.5. Correct vaginal access

Delivery of the posterior arm

Delivering the posterior arm will reduce the diameter of the fetal shoulders. This will usually provide enough room to resolve the shoulder dystocia.

Often, babies lie with their arms flexed across their chest and so, as your hand enters the vagina posteriorly, you will feel the fetal hand and forearm of the posterior arm.

In this case, take hold of fetal wrist (with your fingers and thumb) and gently pull the posterior arm out in a straight line.

Once the posterior arm is delivered apply gentle traction to the fetal head.

If the shoulder dystocia has resolved, the baby should then be easily delivered.

However if, despite delivering the posterior arm, the shoulder dystocia has not resolved, support the head and posterior arm and gently rotate the baby through 180 degreesThe posterior shoulder will then become the new anterior shoulder and should be below the symphysis pubis, thus resolving the dystocia..

If the baby is lying with its posterior arm straight against its body, rather than a flexed posterior arm, this is much more difficult to deliver.

In this situation, it may be easier to perform internal rotational manoeuvres instead, as the straight arm will need to be flexed so that the wrist can be rasped.

The wrist can then be grasped and the arm delivered as previously described. If you can not reach the wrist, it is best not to pull on the upper arm as this is likely to result in a humeral fracture.

Internal rotational manoeuvres

The aims of internal rotation are:

- to move the fetal shoulders (the bisacromial diameter) out of the narrowest diameter of the mother's pelvis (the anterior-posterior) and into a wider pelvic diameter (the oblique or transverse).
- to reduce the fetal bisacromial diameter
- to use the maternal pelvic anatomy: as the fetal shoulders are rotated within the mother's pelvis the fetal shoulder descends through the pelvis due to the bony architecture of the pelvis.

Figure 7.6. Location of the posterior arm

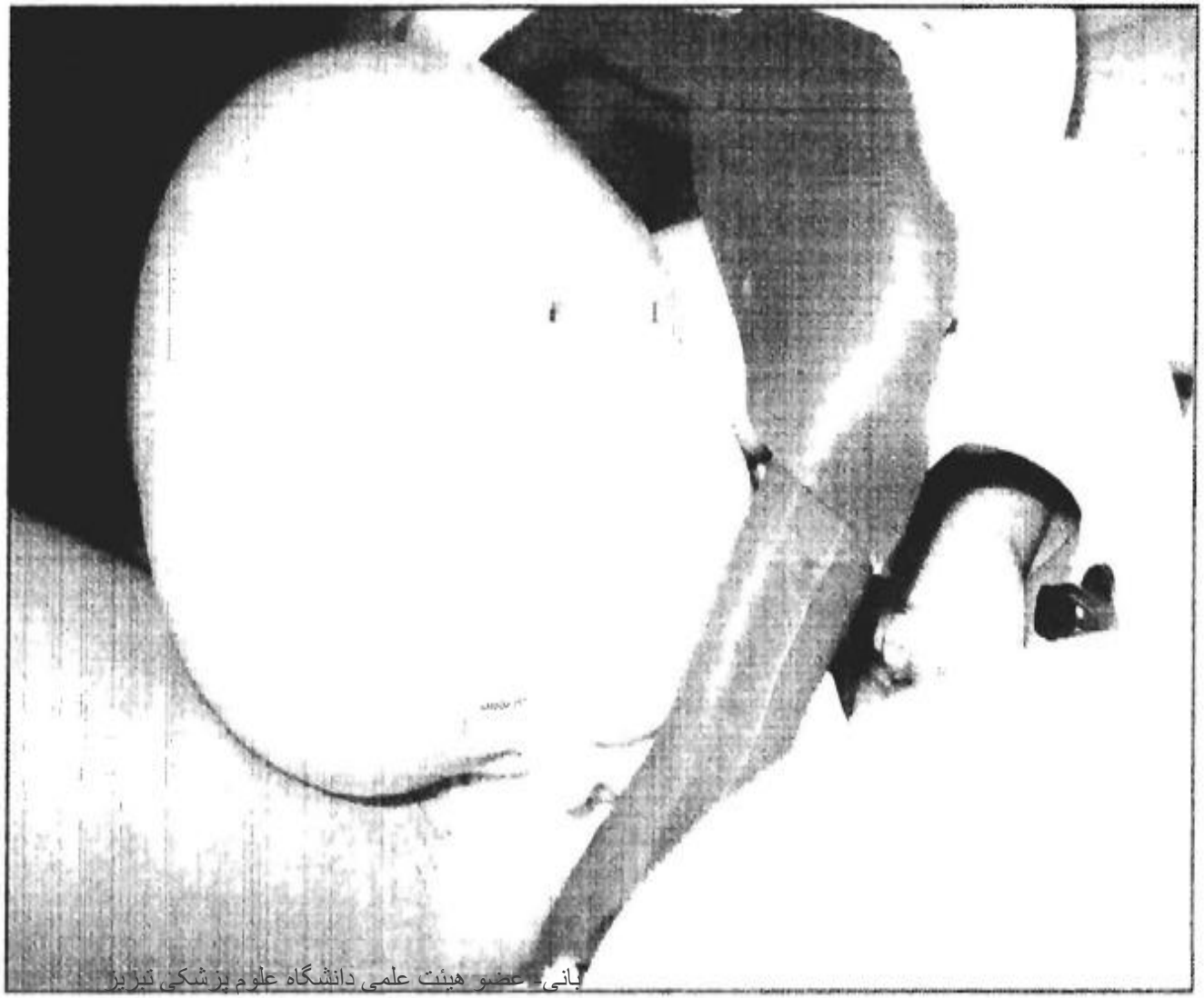


Figure 7.7. Grasp the wrist of the posterior arm

Figure 7.8. Gentle traction on the posterior arm in a straight line

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Internal rotational manoeuvres were originally described by Woods and Rubin.

Rotation can be most easily achieved by pressing on the anterior(front) or posterior (back) aspect of the posterior (lowermost) shoulder. Pressure on the posterior aspect of the posterior shoulder has the added benefit of reducing the shoulder diameter by adducting the shoulders (scrunching the shoulders inwards).

Rotation should move the shoulders into the wider oblique diameter, resolving the shoulder dystocia, so that delivery is possible with routine traction.

If delivery does not occur continue the pressure and, by swapping hands, rotate the shoulders a complete turn (180-degree rotation). This manoeuvre (as with rotation after delivery of the posterior arm) substitutes the anterior shoulder for the posterior shoulder and will resolve the dystocia.

If pressure in one direction has no effect, try to rotate the shoulders in the opposite direction by pressing on the other side of the fetal posterior shoulder. If you are struggling, try changing the hand you are using.

If pressure on the posterior shoulder is unsuccessful, apply pressure on the anterior fetal shoulder. This is more difficult, as it is hard to reach the anterior shoulder. From the sacral hollow, follow the fetal back up to the anterior shoulder. Apply pressure on the posterior aspect of the anterior shoulder to adduct and rotate the shoulders into the oblique diameter.

While attempting to rotate the fetal shoulders from the inside of the pelvis,you can instruct a colleague to perform suprapubic pressure to assist your rotation. Ensure that you are pushing with and not against each other.

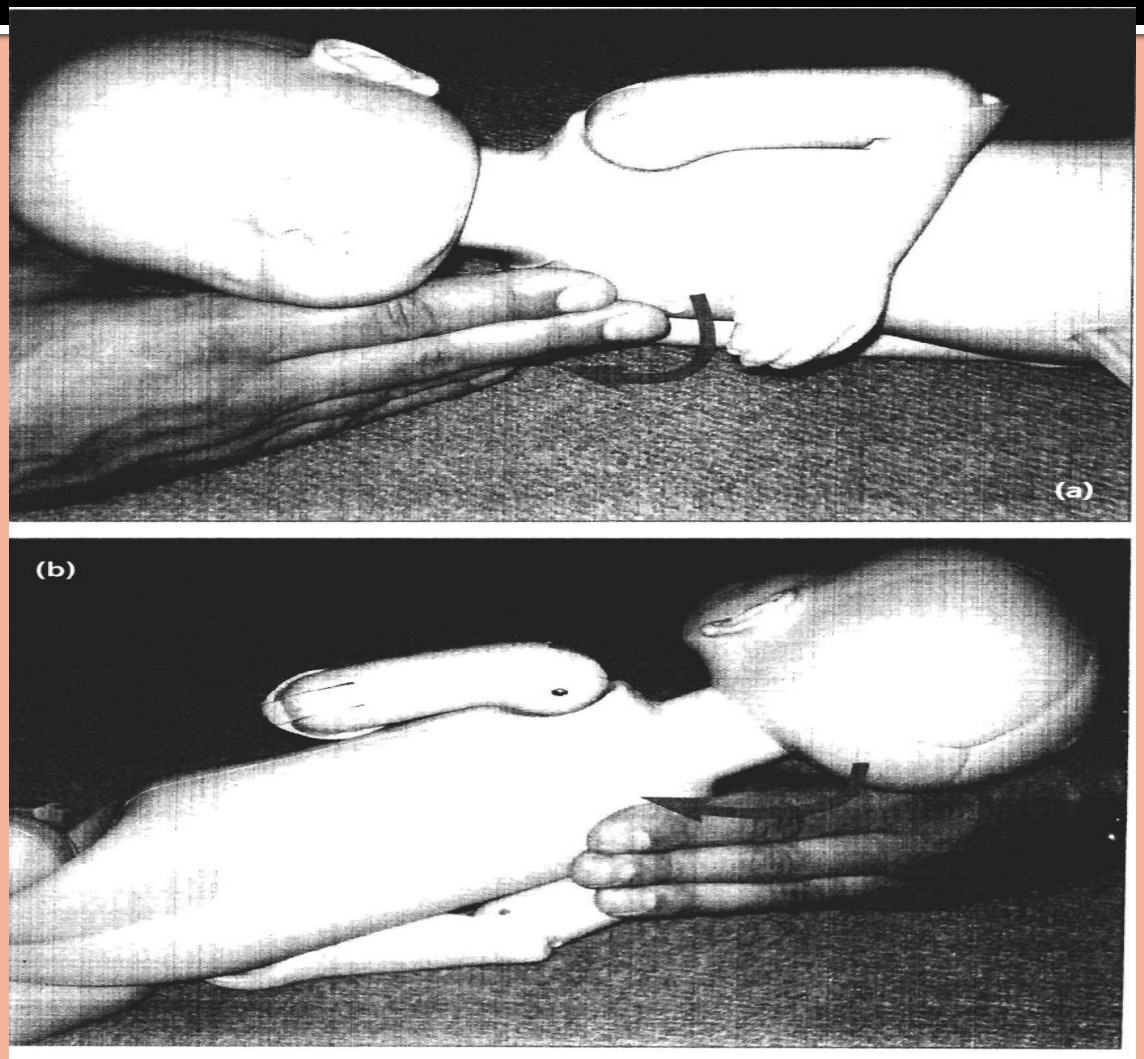

Figure 7.9. Internal rotational manoeuvres: (a) pressure on the anterior aspect of the posterior shoulder to achieve rotation; (b) pressure on posterior aspect of posterior shoulder to achieve rotation

All-fours position

Additional manoeuvres

In the UK, manoeuvres such as cephalic replacement (Zavanelli manoeuvre), symphysiotomy and cleidotomy (deliberate fracture of the clavicle) are uncommon. They are mainly considered as last-resort measures.

- **What to avoid?**
- ***Traction***
- ***Fundal pressure***
- **Documentation**

SHOULDER DYSTOCIA DOCUMENTATION

Date .....
Time .....
Person completing form .....
Signature .....

Mother's name _____
Date of birth _____
Hospital number _____
Consultant _____

Called for help at:		**Emergency call via switchboard at:**		
Staff present at delivery of head:		**Additional staff attending**		
Name	**Grade**	**Name**	**Grade**	**Time arrived**

Procedures used to assist delivery	**By whom**	**Time**	**Order**	**Details**	**Reason if not performed**
McRoberts' position					
Suprapubic pressure				From maternal **left / right**	
Episiotomy				Enough access / tear present / already performed	
Delivery of posterior arm					
Internal rotational manoeuvre					
Description of rotation					
Description of traction	Routine	Other:		Reason if not routine:	
Other manoeuvres used					

Time of delivery of head		**Time of delivery of baby**		**Head-to-body delivery interval**	
Fetal position during dystocia	Head facing maternal **left**		Head facing maternal **right**		
Birth weight	**kg**	**Apgar score**	**1 minute:**	**5 minutes:**	**10 minutes:**
Cord gases		**Art pH :**	**Art BE:**	**Venous pH :**	**Venous BE :**
Explanation to parents	Yes	No		**Incident form completed**	Yes / No

Figure 7.10. An example of a shoulder dystocia documentation pro forma

It is important record:

- the time of delivery of the head
- the manoeuvres performed, the timing and sequence
- the traction applied
- the time of delivery of the body
- the staff in attendance and the time they arrived
- the condition of the baby
- umbilical cord blood acid-base easurements (cord pH)

morbidity and mortality

Perinatal	Maternal
Stillbirth	Postpartum haemorrhage
Hypoxia	Third- and fourth-degree tears
Brachial plexus injury	Uterine rupture
Fractures (humeral and clavicular)	Psychological distress

- Acidosis
- Brachial plexus injury:
  Erb's palsy
  Klumpke's palsy
  Total brachial plexus injury
- Humeral and clavicular fractures

Shoulder distocia is an unpredictable obstetric emergency

Problem	Clearly state the problem
paediatrician	Immediately call the aediatrician/neonatologist
pressure	Suprapubic (NOT FUNDAL) pressure
posterior	Vaginal access gained posteriorly
Pringle	Get the whole hand in
Pull	Don't keep pulling if a manoeuvre has not worked
Pro forma	Documentation should be clear and concise
Parents	Communication is essential

از توجه شما عزیزان متشکرم