Frimley Health NHS Foundation Trust

Shoulder Dystocia

Key Points

- Recognising and managing shoulder dystocia
- Brachial Plexus Injury

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Abbreviations

BPI	Brachial plexus injury
CTG	Cardiotocograph
HIE	Hypoxic ischemic encephalopathy
PPH	Post partum haemorrhage

Contents

1. INTRODUCTION

1.1 Frimley Health NHS Foundation Trust is committed to the provision of a service that is fair, accessible and meets the needs of all individuals.

2. DEFINITIONS

2.1 Shoulder dystocia is defined as a vaginal cephalic delivery that requires additional obstetric manoeuvres to deliver the baby after the head has delivered and routine axial traction has failed[1]

It occurs when the bisacromial diameter (breadth of shoulders) exceeds the diameter (anterior-posterior) of the pelvic inlet.[2] Usually the anterior shoulder impacts on the maternal symphysis, less commonly, the posterior shoulder impacts on the sacral promontory.[3]

3. SHOULDER DYSTOCIA

3.1 Incidence of shoulder dystocia

There is a large difference in the rates of shoulder dystocia that are reported. These vary from 0.58% and 0.70% [3], and 0.1% and 3%.[4] The incidence also varies depending on birthweight, occurring between 0.6% and 1.4% for infants 2.5kg to 4kg and 5-9% for infants 4 to 4.5kg. [2]

3.2 Outcomes associated with shoulder dystocia

The risk of both maternal and fetal morbidity is increased with shoulder dystocia, even when well managed. There is an increased risk of PPH and 3rd and 4th degree tears.

Brachial Plexus injury is a significant complication for the baby following a shoulder dystocia occurring in 2.3 to 16% of these cases. The most likely cause for this is thought to be excessive traction to the fetal head.[5] Although it is thought that there may be other contributing factors such as maternal force. [3]

Acidosis with potential long-term neurological damage, and humeral and clavicular fractures may also occur following shoulder dystocia.

3.3 Factors associated with shoulder dystocia[5]

Most cases of shoulder dystocia occur in women with no risk factors. Below are the antenatal and intrapartum risk factors associated with the likelihood of shoulder dystocia;

Pre labour
Previous Shoulder dystocia
Macrosomia >4.5kg
Diabetes Mellitus
Maternal body mass index >30kg/m^2

Intrapartum
Prolonged first stage
Secondary arrest
Prolonged second stage labour
Oxytocin Augmentation
Instrumental delivery.

3.4 Antenatal management

Large fetal size increases the risk of shoulder dystocia and brachial plexus injury. Induction of labour should be offered to women with a suspected macrosomic baby (>95th centile), and a pathological cause, i.e., diabetes between 37+0 and 38+6, as this is associated with a reduction in shoulder dystocia. This should be discussed, along with associated risks of early induction of labour.

The reported recurrence rate of shoulder dystocia is 1 to 25%. Either elective caesarean section or vaginal birth would be options after a previous shoulder dystocia and the decision should be made after discussion between the woman and her obstetrician.[3]

3.5 Recognition of shoulder dystocia

Midwives and Obstetricians should routinely observe for signs of a shoulder dystocia:[3]

- Difficulty with delivery of the face and chin
- Once the head is born it remains tight to the vulva, or retracts in turtleneck sign
- Failure of the head to restitute.
- Failure of the shoulders to descend with maternal effort or routine axial traction.

Axial traction is in line with the fetal spine, without downward traction or lateral deviation.

Routine McRoberts/knees to the chest should not be performed before the birth of the head as a prophylactic procedure as it is ineffective. It may also affect counselling for future pregnancies.[5]

If the woman is in the birthing pool and shoulder dystocia is suspected, she should be asked to get out safely. No manoeuvres can be performed in the pool. [5]

3.6 Management of shoulder dystocia

Once the fetal head is delivered it must be assumed that the cord is compressed between the fetal body and maternal pelvis. The pH will fall at 0.01/minute until respiration is established[5]. One study suggests low rates of hypoxic ischaemic injury if the head to body interval is less than 5 minutes when there is no evidence of prior compromise on CTG. One study reports much lower rates of HIE when the head to body interval is <5 minutes (0.5% compared to 23.5% when >5 minutes). [6]

The following is a description of the RCOG algorithm for management of shoulder dystocia (Appendix 2)[3,5]

Call for help

- Pull emergency buzzer
- State this is a shoulder dystocia
- Ask for 2222 Obstetric Emergency call in the hospital. This will call for senior midwife, obstetric registrar, obstetric consultant, obstetric anaesthetist. It will also alert theatres teams in case transfer is required, and the neonatal team. At WPH, for the neonatal team to attend, a separate 2222 call for neonatal emergency needs to be put out.
- In the community call 999 and request a time critical paramedic ambulance.

Ask the woman to stop pushing
Continuous pushing can increase the impaction of the shoulders and increase the risk of brachial plexus injuries.

What to avoid.

- Never apply excessive traction
- Do not apply downward traction, always axial
- NEVER apply fundal pressure. It is associated with high rates of brachial plexus injuries and rupture of the uterus.

McRoberts manoeuvre/knees to the chest**.**

This increases the anteroposterior diameter of the pelvic inlet and straightens the sacrum relative to the lumbar spine.

- Lay the woman flat and remove any pillows.
- If in lithotomy position remove her legs from the supports and straighten to achieve McRoberts/knees to the chest.
- With an assistant on each side hyperflex the woman's legs, knees to chest.
- Apply routine axial traction to assess if the shoulders have been released. If not do not try again, proceed to the next manoeuvre maintaining McRoberts/knees to the chest.

Suprapubic Pressure.

This aims to reduce the fetal bisacromial diameter and rotate the anterior fetal shoulders into the wider oblique diameter of the maternal pelvis.

- An assistant applies suprapubic pressure using a 'CPR style' grip on the side of the fetal back.
- Just above the maternal symphysis in a downward and lateral direction.
- It should be rocking or continuous, there is no evidence one is more effective.
- If the anterior shoulder is not released after suprapubic pressure and axial traction, move on to the next manoeuvre. There is no evidence to support continuing for 30 seconds.

Consider an episiotomy

Only consider if one is needed to allow whole hand entry for internal manoeuvres. An episiotomy will not relieve the bony impaction. There is almost always enough room for internal manoeuvres without one.

Internal manoeuvres

There is no evidence to suggest which order to perform the following internal manoeuvres. The order should be decided on clinical judgement and experience.

All internal manoeuvres start with inserting the whole hand posteriorly into the sacral hollow. This is done by placing the tips of all fingers and thumb together to make the hand as narrow as possible (as if putting on a tight bracelet or reaching for the last crisp at the bottom of a cylindrical container).

Internal rotational manoeuvres

The aims are to move the fetal shoulders out of the narrowest diameter of the mother's pelvis (anterior-posterior) and into a wider pelvic diameter (transverse). It should not be necessary to rotate the shoulders more than 20-30^{o}

- Apply pressure to the posterior (back) aspect of the posterior (lowermost) shoulder. The shoulders should be rotated into the wider oblique diameter, resolving the shoulder dystocia.
- If this does not work, apply pressure to the anterior (front) aspect of the posterior (lowermost) shoulder.
- If you are struggling, try using your other hand
- If the above is unsuccessful, try reaching the anterior shoulder from the sacral hollow, follow the fetal back up to the anterior shoulder. Apply pressure to the posterior (back) aspect of the anterior (uppermost) shoulder and rotate the shoulders in the oblique diameter

- While attempting to rotate the shoulders internally, you can ask an assistant to apply supra-pubic pressure to assist with the rotation. Ensure you are pushing with and not against each other.

Deliver the posterior arm

- Ask for supra-pubic pressure to be stopped
- Enter the vagina posteriorly with your full hand as described above
- Check whether you can feel the fetal hand and forearm of the posterior arm, and is the baby has its arms flexed across their chest. If so:
    - Take hold of the fetal wrist and gently release the posterior arm in a straight line. Once the posterior arm is delivered, apply routine axial traction on the head. If routine traction doesn't result in delivery of the shoulders, support the head and posterior arm and rotate the baby 180 degrees. The posterior shoulder now becomes the anterior shoulder and should be below the pubis symphysis, resolving the dystocia.

- If the posterior arm is straight in front of the fetal abdomen it may be easier to attempt internal rotational manoeuvres first. To remove the posterior arm if it is straight:
    - Follow the arm down to the elbow, place your thumb in the antecubital fossa and apply pressure to the back of the forearm just below the elbow. This should flex the arm.
    - Then grasp the wrist and deliver the arm as described above

    - If you cannot reach the wrist, do not pull on the arm, as this can result in a humeral fracture.

All fours position OR repeat all the above again

In some individual circumstances, it may be appropriate to try the all-fours position before internal manoeuvres. For instance, in a slim, mobile mother without an epidural and with a single midwifery attendant.

- Roll the mother onto her hands and knees so that the maternal weight lies evenly on all four limbs, the knees and hips should be flexed (Mimicking Mcroberts position)
- Apply routine axial pressure.
- If the dystocia remains, internal manoeuvres can be re-attempted.
- Remember that the maternal sacral hollow and the fetal posterior shoulder will now be uppermost.

Additional Manoeuvres

Several last resort manoeuvres which should only be performed by a senior obstetrician when all standard measures have failed:

- Cleidotomy. Deliberate fracture of the baby's clavicle, this could be bilateral
- Zavanelli manoeuvre. Replacement of the fetal head and category 1 caesarean section. A bolus of subcutaneous terbutaline 250 micrograms, or glyceryl trinitrate sublingually, should be given prior to this procedure.
- Symphysiotomy. Surgical division of the symphysis pubis.

Birth attendants should be alert to the possibility of postpartum haemorrhage (PPH) and severe perineal trauma.[3] These occur at a rate of 11% and 3.8% following shoulder dystocia.

3.7 Standards for documentation

Either complete the shoulder dystocia proforma (Appendix 1) and upload to Epic or complete the emergency proforma on the maternal emergency narrator tab on Epic:

- Time of the delivery of head and the time of the body and note the interval
- Direction fetal face is looking, and which was the anterior shoulder
- Timings and sequence of manoeuvres used
- Names and role of staff attending, and time of arrival
- Paired umbilical cord acid-base measurements
- Neonatal assessment of the baby, including the Brachial Plexus injury assessment (Appendix 3)
- In phase should be completed for all cases of shoulder dystocia.

3.8 Process for the follow up of babies

There are several reported fetal injuries following shoulder dystocia. These include Brachial Plexus Injury, humeral and clavicular fractures, pneumothoraces, and hypoxic brain injuries.[3]

If there are any concerns with the baby following shoulder dystocia (i.e. signs of Erb's palsy, suspected clavicle fracture) a review and examination by a paediatric registrar or consultant should be carried out.

4. BRACHIAL PLEXUS INJURY

4.1 Definition of Brachial Plexus Injury (BPI)

The Brachial Plexus contains 5 large nerves which originate in the spinal cord (C5-C8, T1). They convey motor, sensory and sympathetic nerve fibres to the arm and shoulder. Nerve fibres from T1 supply to the head, neck and upper limbs. They control sweat glands, pupillary dilation and eyelid movement.[5] The injury occurs when there is damage to these nerves.

Incidence

BPI occurs in 2.3-16% of deliveries where shoulder dystocia has occurred.[3] The overall incidence is 0.43 per 1000 births.[5] Most cases resolve spontaneously, 8 – 12% last more than 12 months.[7]

Examination of the baby

Signs of BPI include:[5,8,9]

- Absent or restricted movement of the affected limb.
- Lower arm extended and rotated towards the body with the hand held in a waiters tip position.
- Loss of finger extension or movement.
- Observe movement supine and side lying
- Compare left and right side[10]
- Observe for signs of Horners syndrome (meiosis, ptosis, enothalmos, anhydrosis). This is a sign of a total brachial injury.
- Signs of pain

The findings of this assessment should all be documented.

Management

- Review by paediatric registrar for all babies following a shoulder dystocia, if any concerns
- Referral to and assessment by physiotherapist (Frimley: inpatient Epic referral / Wexham: call extension 153500 or 154345). They will demonstrate exercises to the parents and review in outpatients in 2 weeks.
- Consider if analgesia is needed.
- X-ray both clavicles and review[10]
- Referral to orthopaedic surgeon[10]
- Arrange paediatric outpatient appointment for 6 weeks.
- Inform obstetric team
- Complete InPhase.
- Provide the parents with information on the Erbs Palsy Group

5. TRAINING

5.1 All staff are required to attend annual PROMPT (Skills) training which includes the management of shoulder dystocia training. The trust requires 90% of relevant staff have completed PROMPT training within the previous 12 months.

6. MONITORING COMPLIANCE OF GUIDELINE

6.1 All cases of shoulder dystocia, and actual or suspected BPI will be reviewed by the maternity patient safety team as a continuous audit.

Where risk issues are identified, or if there is an actual or suspected BPI, the case will be reviewed with on-going management in the maternity patient safety team.

Shoulder dystocia and the number of babies with brachial plexus injures will be monitored via the monthly maternity dashboard.

7. AUDITABLE STANDARDS

Process and use of shoulder dystocia scribe form/maternity emergencies narrator form.

Completion of Epic shoulder dystocia record.

Baby examined by paediatric Registrar or consultant before discharge.

If Brachial plexus injury found, all babies reviewed by a senior paediatrician and referred to a physiotherapist.

Completion of Brachial Plexus injury checklist.

8. REFERENCES

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APPENDIX 1: SHOULDER DYSTOCIA DOCUMENTATION PROFORMA

(For reference or for use during Epic downtime.)

Date: Time:	Addressograph or patient ID
Print name of person completing this form: Signature: Designation:	

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

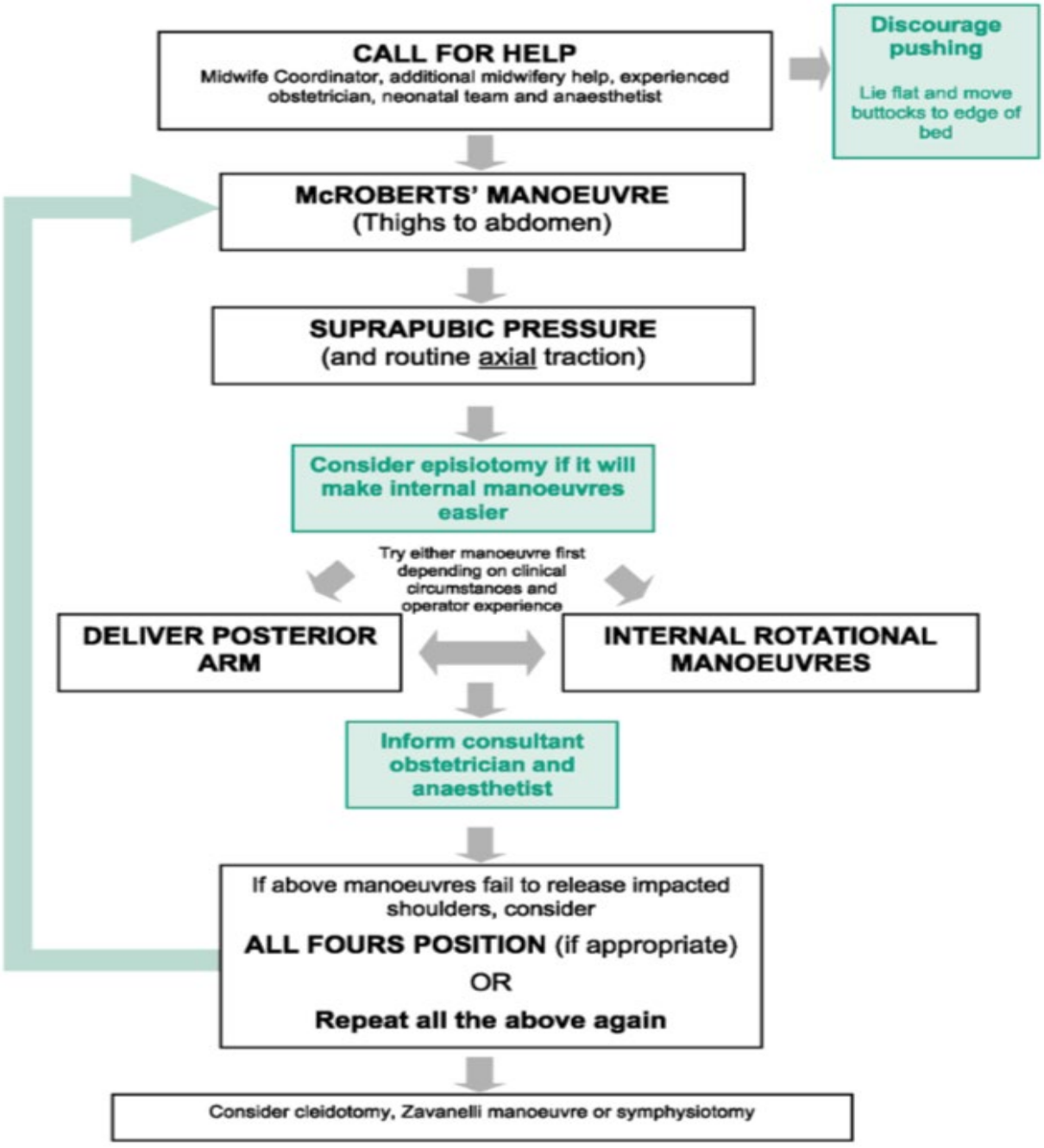
PROCEDURES USED TO ASSIST DELIVERY	TIME	BY WHOM	Details (circle as appropriate)
McRoberts' Position			
Suprapubic pressure			Maternal **left / right**
Episiotomy			Enough access / tear present / already performed
Internal rotation manoeuvres			
Delivery of the posterior arm			**Right** / left arm
Any other manoeuvres (e.g. Roll)			

Delivery of head	Spontaneous / Ventouse / Forceps		**Apgar Scores**	
Time of delivery of head			1 min	
Time of delivery of baby			5 mins	
Head-to-body interval			10mins	
Fetal position	Head facing maternal left **Left fetal shoulder anterior**  or Head facing maternal **right** **Right fetal shoulder anterior** 		Birth Weight (kg)	
Description of traction	Routine axial / other Reason if not routine axial:			
Cord Gases	Arterial pH: BE:	Venous pH: BE		

Paediatricians present		Time of arrival:
Explanation to parents	Yes ☐ By:	
Incident From completed	Yes ☐ By:	
Newborn checklist commenced	Yes ☐ By:	

Please file this form in the notes.
On-going management should be documented in the maternity notes

APPENDIX 2: ALGORITHM FOR THE MANAGEMENT OF SHOULDER DYSTOCIA



Baby to be reviewed by neonatologist after birth and referred for Consultant Neonatal review if any concerns

DOCUMENT ALL ACTIONS ON PROFORMA AND COMPLETE CLINICAL INCIDENT REPORTING FORM.

APPENDIX 3: NEONATAL CHECKLIST FOLLOWING SHOULDER DYSTOCIA AND BRACHIAL PLEXUS INJURY

(For reference or for use during Epic downtime.)

Baby' name: Baby's Dob: Baby's Hospital number	Gestation: Consultant:

For all babies following dystocia:

Review by Paediatric Registrar or Consultant:
Any sign of arm weakness or restricted movement of the affected limb? Y/N
Any sign of potential bony fracture? Y/N
Any loss of finger extension or movement? Y/N
Any sign of Horners syndrome? Y/N

If yes to any of these for consultant paediatric review.

For babies where there is a suspected or actual Brachial Plexus Injury:

No:		Date	Sign
1.	Reviewed by paediatric Reg/Cons		
2.	Referral to Physiotherapy (5706)		
3.	Referral to Orthopaedic surgeon		
4.	Review and advice by Physio		
5.	Physiotherapy follow up booked 2/52		
6.	Paediatric outpatient follow up 6/52		
7.	Erbs palsy leaflet given		
8.	Elbow Flexion by 3 months?		
9.	Referral to specialist centre needed?		

Full version control record

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This guideline has been registered with the trust. However, clinical guidelines are guidelines only. The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician. If in doubt, contact a senior colleague or expert. Caution is advised when using guidelines after the review date. This guideline is for use in Frimley Health Trust hospitals only. Any use outside this location will not be supported by the Trust and will be at the risk of the individual using it.

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