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INTRODUCTION

Obstetric emergencies require quick and decisive action to save the life of the mother and the child. Severe hypertensive disorder, haemorrhage and embolism all threaten the life of the mother. The fetus is directly threatened by umbilical cord accidents, other forms of hypoxia and mechanical delivery problems. Death of the mother was frequent in the early part of the twentieth century in the UK, but due to advances made, this is now less common.

An emergency is defined as a situation or occurrence of a serious and often dangerous nature, developing suddenly or unexpectedly and demanding immediate attention. In an emergency, the fetus is threatened by interruption to its lifeline of the placenta and the umbilical cord. Any emergency is initially treated according to the ABC principle: Airway, Breathing and Circulation.

Shoulder dystocia is an important obstetric emergency. The incidence varies from at least 0.23% up to 1.2% depending on the definition. Shoulder dystocia means difficult delivery of the shoulders. The shoulders should follow the head in the same contraction. If they do not, then the difficulty can range from slight to complete obstruction of delivery, (Campbell & Lees, 2000).

Shoulder dystocia can be an obstetrician’s nightmare, usually occurring unexpectedly, its resolution prompting immediate action. There can be serious consequences for the mother and a fatal outcome for the fetus. It is considered to occur when the fetal shoulders impact at the pelvic inlet following delivery of the head, although strictly the term describes any difficulty in delivery of the shoulders, (Sturdee et al, 2001).

Below I present to you a case history on shoulder dystocia.

CASE REPORT

Mrs AN, a 32 year old nigerian housewife, primigravida, booked in with the midwife at 14 weeks gestation. Her last menstrual period (LMP) was on the 2nd of June 2001, giving her an expected date of delivery (EDD) of the 9th March 2002. It was a planned pregnancy, Mrs AN and her husband had been trying for a baby for the past 5-6 months or so, and prior to this they were using condoms for contraception. As already mentioned above, this is Mrs AN’s first child, and she has never been pregnant before (G1 P0). She hasn’t had any gynaecological problems in the past. Her periods were regular prior to conceiving, with a 28 day cycle with 5-6 days of bleeding. Her last cervical smear test was in November 2000, which was normal. Mrs AN has no other medical problems and she has had no other previous operations. She is not on any medication at present and doesn’t have any known allergies. Mrs AN’s father has non-insulin dependent diabetes mellitus (type 2), but apart from this there is no other relevant family history. Mrs AN has been married to her husband who is
self-employed, for the past 4 years. They live in a lift operated first floor flat in the Tower Hamlets area.

Mrs AN doesn’t drink any alcohol, and has never smoked. They have no pets. Apart from morning sickness, which at this point was decreasing in frequency, she otherwise feels well and has no other symptoms.

On examination, her pulse was 78 regular and BP 120/82 mmHg. Heart sounds I and II were heard and there were no other added sounds. Her chest was clear. There was no neck swelling suggestive of goitre. The abdomen was soft and non-tender, with no scars, organomegaly, pigmentation or striae. There was normal hair distribution and the fundus was just palpable. There was no oedema in the ankles, and on urine dipstick, there was nothing abnormal detected (NAD), although an MSU (midstream urine sample) was sent for microscopy, culture and sensitivities. This came back as negative.

At the booking visit, baseline investigations were done. Bloods were taken for full blood count, blood group and rhesus status, urea and electrolytes, haemoglobin electrophoresis (for sickle cell and thalassaemia), screening for infections such as hepatitis B and C, syphilis status (VDRL), HIV and rubella immunisation. Random blood glucose was also done. The dating scan was consistent with her LMP, giving an EDD of 7th March 2002.

All Mrs AN’s booking investigations came back normal, her random blood glucose was 6.8mmol/l. Mrs AN opted to have the biochemical screening tests for Down’s syndrome and neural tube defects. Her father (ie. a first degree relative) has diabetes, this is a risk factor for the development of gestational diabetes, therefore Mrs AN must have an oral glucose tolerance test at 28 weeks. The result for this came back normal. Subsequent antenatal care visits did not reveal any significant findings. The detailed anomalies scan done at 21 weeks did not show any abnormalities. Mrs AN is rhesus positive, so giving anti-D would not be necessary.

On Thursday 7th March 2002, at 18.00hrs, there was spontaneous onset of labour. She was 39 weeks and four days gestation. Mrs AN was brought to the hospital by her husband, and she was admitted on to labour ward. Mrs AN began to feel contractions for the first time. Contractions were approximately 2 in 10 minutes. The baby was longitudinal lie with cephalic presentation. There was spontaneous rupture of membranes (SROM) at about 19.45hrs, the liquor was clear. Mrs AN began to feel the pain more and more with each contraction, although Entonox did give some relief. At about 22.00hrs, Mrs AN felt very distressed due to the pain, an anaesthetist was called and an epidural was given. Syntocinon (oxytocin infusion) was started to augment labour at a rate of 2 milli-units per minute and increased at intervals. She progressed very well until 08.00hrs the following day (8-03-02), she was fully dilated by this time. Mrs AN, now in the 2nd stage of labour was very tired. She tried to rest as much as she could in between contractions, taking a few sips of water as she felt thirsty, but there was no let up in pain.

CTG monitoring showed a baseline fetal heart rate of 130 beats per minute, with normal baseline variability of 10-15 beats per minute and appropriate accelerations, but also a couple of decelerations.

As Mrs AN wasn’t progressing as much as one would like her to be, mainly due to exhaustion, she was told by the midwife to have a rest and then at 10.00hrs she would be reassessed. The midwife also felt that Mrs AN wasn’t able to feel the contractions so well due to the epidural. At 10.00hrs, Mrs AN felt ready to push and began pushing. She gave 3 big pushes with each contraction. Mrs AN
found it extremely hard work, she was almost in tears due to the pain. She kept saying that she can’t do it anymore, but the midwife as well as myself tried to encourage her as much as possible to keep going.

By 10.30hrs, Mrs AN was put into the lithotomy position. Here the patient lies with her legs in stirrups and her buttocks close to the lower edge of the table. She is then in the ideal position for the attendant to deal with any complications which may arise, and that she has more power to push against when she gets a contraction.

At 11.30hrs, the head became visible at the perineum. At 12.45hrs the head was delivered, however the Turtle sign was seen by the midwife delivering the baby, and she realised that the shoulders wouldn’t deliver, they seemed to be ‘stuck’, and told the student midwife to press the alarm to summon senior help. The labour ward Senior Sister came into the room almost immediately. The paediatric crash team were also summoned. The Senior Sister instructed Mrs AN, to be ‘on all fours’. Mrs AN was turned over on to her hands and knees. An episiotomy was not carried out. Sister then delivered the anterior shoulder, and then the rest of the baby followed. A male infant was delivered at 12.45hrs. He did not cry at birth. The cord was clamped and cut and baby was then taken straight to the resuscitaire. The paediatric SHO was present. The baby did not need to be resuscitated. Baby was suctioned and oxygen was given immediately via a facemask. Baby was wrapped and warmed, it was breathing spontaneously and it had a good pulse. Baby’s APGAR scores were: 8 at 1 minute, 9 at 5 minutes and 10 at 10 minutes. His temperature was 37.0°C, heart rate at the apex was 150 beats per minute, respiratory rate was 48 breaths per minute, and he weighed 4.190kg. BM stix 2.4 mmol/l. The infant had caput, described by the midwife as ‘sugar loaf head’. This is due to moulding of the head to the shape of the maternal pelvis, to allow it to pass more easily through the pelvis. The caput, which is essentially a swelling of oedematous skin on the head due to close pressure of the cervix, will disappear on it’s own accord over the next few days.

Vitamin K was given. No abnormalities seen on baby when examined initially by the paediatric SHO.

Syntometrine 1ml was given im at 12.46hrs. The uterus had fully contracted. At 13.01hrs, the placenta was delivered. Cord blood taken for pH; Arterial pH 7.378 and venous pH 7.165. Mrs AN had a 2nd degree perineal tear which was sutured after infiltration with lignocaine 1% 10ml. Postnatal observations: temperature 36.60c, pulse 82 and BP 110/73. Uterus well contracted and normal lochia seen.

Baby was seen and examined by paediatric SHO with regards to the difficult delivery of the shoulders and nothing abnormal, such as a nerve palsy or a fractured clavicle was detected.

Mrs AN was overjoyed by the fact that she had just given birth to a baby boy who was alive and well after the frightening emergency. She was also extremely relieved that the long process of labour was finally over.

DISCUSSION

Recalling the mechanism of normal delivery is the key to understanding what occurs in shoulder dystocia. It is important to remember that although the bisacromial diameter of a fully grown term fetus is greater than the biparietal diameter, the shoulders are mobile and compressible and the pelvic inlet is normally wider in the oblique diameter than the posterior. During labour, uterine contractions lead to flexion and engagement of the fetal head, if this hasn’t occurred already. The head enters the pelvis inlet in the occipitotransverse position, with the shoulders lying
anterioposterior at this stage. Internal rotation of the head occurs as the head reaches the level of the ischial spines, while the shoulders rotate to the oblique position. Fetal head extends as it comes through the pelvic outlet. The shoulders pass through the pelvic inlet in the oblique position. The posterior shoulder enters first, coming to rest in the sacral hollow or over the sacrosciatic notch, while the anterior shoulder follows it to lie over the obturator foramen. As further descent occurs, the anterior shoulder emerges from under pubic ramus and the shoulder girdle rotates to allow delivery in the anterioposterior position, which is usually assisted by lateral flexion of the body. It is important to appreciate that, in shoulder dystocia, the point of obstruction occurs at the inlet of the pelvis. Usually the posterior shoulder enters the pelvis, but the anterior shoulder, having failed to rotate to the oblique position, remains trapped behind the symphysis pubis. Once the shoulders impact at the pelvis inlet, the fetal head which has already left the pelvis, often recoils tightly against the maternal perineum. This is termed the ‘Turtle sign’, and as in Mrs AN’s case, it was the first sign of shoulder dystocia occurring (Sturdee et al, 2001).

A number of antenatal and intrapartum factors are associated with the occurrence of shoulder dystocia. Important antenatally are the following: large baby (fetal macrosomia), small mother, excessive maternal birthweight, maternal obesity, diabetes mellitus, postmaturity and previous shoulder dystocia or big baby. Important factors during labour are: prolonged first stage of labour, prolonged second stage of labour and forceps or vacuum extraction. Fetal macrosomia is the most important factor, (Campbell & Lees, 2000).

Fetal Macrosomia is variously and arbitrarily defined as an actual birthweight of 4000 grams or more. As birth weight increases so does the occurrence of shoulder dystocia. While only approximately 10% of infants are 4000g or more, up to 60% of shoulder dystocia cases are seen in this group (Acker et al, 1986). This may have been the case for Mrs AN, as although they knew that her baby was big, it wasn’t thought that it would more than 4000g, which it did.

The association between maternal diabetes and shoulder dystocia has long been recognised. This is due to the high levels of glucose causing high levels of fetal insulin which leads to fat deposition and hence a macroscopic baby (Sturdee et al, 2001). Mrs AN doesn’t have diabetes, and nor did she develop gestational diabetes. However, her father does have type 2 DM.

Slow progress during the first stage of labour and prolonged second stage has been reported as strongly associated with shoulder dystocia, as has the resultant need for labour augmentation. These associations tend to be much stronger with increasing fetal weight, (Baskett & Allen, 1995). It can be seen quite clearly from the history that is what had happened in the case of Mrs AN. It is possible that delayed labour or abnormalities of labour indicate a ‘protective’ mechanism against fetopelvic disproportion. If this is the case then augmentation and induction are probably not factors contributing to the dystocia but simply indicate that there is an underlying problem. It is similarly difficult to envisage a mechanism by which epidural anaesthesia would cause impaction of the shoulders at the pelvic brim. An increased need for analgesia may conceivably result from prolonged labour and increased activity by a uterus trying to overcome resistance to the passage of a macroscopic fetus, (Sturdee et al, 2001).

Management of shoulder dystocia

The problem with shoulder dystocia is the failure of the fetal shoulders to enter the pelvic inlet. Manoeuvres to overcome shoulder dystocia should be performed with the intention to increase relative pelvic space. In cases of shoulder dystocia, there is a plan of action. The Royal London hospital uses this pneumonic:
H   call for Help/Senior aid

E   Episiotomy

L   Legs flexed & abducted - McRobert’s Manoeuvre

P   Suprapubic Pressure – to disimpact & rotate shoulders

E   Extract posterior shoulder - Wood’s Screw Manoeuvre

R   Reverse screw? Replace head & do LSCS?

If all above fails, try symphysiotomy, cleidotomy or Zavanelli manoeuvre  

(Naftalin & Dorman, 2002)

Help – prior to embarking upon any manoeuvres to resolve the dystocia, the most experienced midwife must be summoned immediately, together with paediatric and anaesthetic assistance.

Left Lateral Position – is frequently the first manoeuvre employed by midwives when difficulties have been anticipated. It is probable that the position simply gives better access for traction posteriorly on the fetus, allowing mild degrees of dystocia to be overcome. The advantage is that the patient can be transferred into this position rapidly with minimal assistance, (Sturdee et al, 2001).

McRobert’s Manoeuvre – More significant degrees of dystocia will probably not deliver in the left lateral position and therefore most authorities now recommend immediate use of the ‘McRobert’s manoeuvre’ to position the patient. The patient lies in the supine position and her hips are flexed so that her thighs lie against her abdomen. This straightens her sacrum relative to the lumbar spine and rotates the symphysis pubis towards the patient’s head, thereby reducing the angle of inclination of the pelvic inlet when compared with the lithotomy position. It has no effect on the dimensions of the pelvis but the rotation of the symphysis pubis encourages the anterior shoulder to disimpact and pass under it. Maximum benefit comes if two assistants are used, one holding each maternal leg to produce hyperflexion of the hips, (Gonik et al, 1989).

Gherman et al (1997) have shown that McRobert’s manoeuvre is associated with a significant degree of success in relieving shoulder dystocia, and maybe associated with decreased morbidity compared with other manoeuvres. On the basis of these findings, they recommend McRobert’s manoeuvre as the initial technique for disimpaction of anterior shoulder.

All - Fours position – this is the manoeuvre that Mrs AN had. The all-fours manoeuvre consists of moving the patient to her hands and knees. The exact mechanism of how the dystocia is relieved is not clear although body altered gravitational effect and increased pelvic diameters are proposed. Good results are claimed with minimal morbidity for both mother and neonate, and most of the other manoeuvres are said to be possible in the all-fours position. While it would appear that moving the labouring woman into this position would be difficult, especially with epidural anaesthesia in place, its proponents claim otherwise, so it is certainly worth attempting this manoeuvre in view of its apparent efficacy, (Bruner et al, 1998).

Suprapubic Pressure - In order to dislodge the anterior shoulder from it’s place of impaction behind the symphysis pubis, suprapubic pressure can be applied by an assistant using a modification of the
technique of ‘rocking’ the fetal shoulders. Firm pressure is applied to the posterior aspect of the anterior shoulder through the maternal abdominal wall, in order to encourage rotation of the shoulder girdle to the oblique position and the anterior shoulder to slip under the symphysis, (Sturdee et al, 2001).

Episiotomy – An episiotomy is a surgical incision of the perineum made to increase the diameter of the vulval outlet during childbirth. The role of the episiotomy is to allow access to the pelvic cavity by the midwife or obstetrician in charge, to facilitate intravaginal manipulations rather than to aid the delivery of the shoulders, (Campbell & Lees, 2000).

Wood’s Screw Manoeuvre – This manoeuvre first described by Woods and Westbury (1943), compared the fetal shoulders to a screw and the maternal pelvis to a thread. In order for the screw to pass through the thread, the shoulders must rotate. Direct pulling will not release the fetus. The technique involves pushing on the anterior aspect of the posterior shoulder, thereby rotating it through 180 degrees. One problem with this manoeuvre is that the shoulders will tend to abduct thereby increasing the bisacromial diameter, which may be counterproductive.

Delivery of the posterior arm – This manoeuvre reduces the bisacromial diameter and allows rotation of the shoulders by traction on the arm. This, by relieving the impaction, will allow the anterior shoulder to enter the pelvis. If the fetus is lying with its back to the right, the operator’s hand is inserted into the sacral hollow, and vice versa. The humerus is identified and followed to the elbow, which is then flexed and swept across the chest. The wrist is then grasped and the arm delivered. Unfortunately, the fetal humerus is often fractured using this technique, (Sturdee et al, 2001).

Clavicular Fracture and Cleidotomy – The aim of these procedures is to reduce the bisacromial diameter. The clavicle often spontaneously fractures when there is shoulder dystocia, or as a result of the manoeuvres to overcome it, but can be intentionally broken. Cleidotomy would normally only be employed on a dead fetus, (Sturdee et al, 2001).

Cephalic replacement and Symphysiotomy / Zavanelli manoeuvre - Cephalic replacement is unusual in that, rather than attempting to complete vaginal delivery, the mechanism of normal delivery is reversed to replace the fetal head in the pelvis and the fetus is then delivered by caesarean section. It has come to be known as the Zavanelli manoeuvre. Sandberg (1999) suggests that replacement of the head is generally easy, with minimal maternal or fetal trauma, and that once performed there is no great urgency to perform abdominal delivery. However, there have been reports of difficulty achieving replacement of the head, and the reported ease of the manoeuvre has been questioned, (Sturdee et al, 2001). Logic dictates that serious maternal trauma can be incurred.

Symphysiotomy is a useful treatment option in severe shoulder dystocia, as it markedly increases the pelvic capacity, especially the oblique diameters, possibly by as much as 25%. The technique is also quick and therefore maybe lifesaving for the fetus. The woman is placed in the lithotomy position with assistants to control the degree of hip abduction and restrict the separation of the pubic bones. Local anaesthetic is infiltrated into the symphysis pubis area, a urinary catheter is inserted so that the urethra can be displaced laterally, and the fibrocartilage of the joint divided with a scalpel. The potential hazard with this technique is damage to the lower urinary tract and anterior vaginal wall. The use of either technique can only be recommended when all other manoeuvres have failed, (Hartfield, 1986).

CONSEQUENCES
As with all manoeuvres and methods of intervention, there are certain complications associated with the above manoeuvres, some have already been mentioned.

Maternal Consequences – There is a high incidence of soft tissue trauma in the lower genital tract and uterine atony. Rates of postpartum haemorrhage vary from 14.2% to 23%, while those of vaginal tears vary from 12.5% to 19.3% (Sturdee et al, 2001). Genitourinary tract infection is also common, and the psychological effect of sustaining a shoulder dystocia upon on the mother should not be underestimated.

Fetal Consequences – Fetal morbidity following shoulder dystocia results from asphyxia and trauma to the peripheral nerves or the skeleton. The incidence of brachial plexus injury varies from 7.9% to 13% after shoulder dystocia. These injuries are usually transient recovering in 80-100% of cases, (Baskett & Allen, 1995). The most common type is Erb’s palsy. This is when there is damage to the upper roots of the brachial plexus (C5, C6 and sometimes C7). The arm is internally rotated and pronated, there is no active abduction or elbow flexion (therefore also known as the waiter’s tip position), (Campbell & Lees, 2000). It occurs during delivery when the baby arm maybe stretched causing compression by the surrounding structures.

Skeletal and peripheral nerve injuries, which occur during the process of delivering the impacted fetal shoulders, are frequently unavoidable, and even exemplary management using appropriate manoeuvres can result in fetal injury. It follows that the more severe the dystocia and the more manoeuvres that are required to overcome it, the greater the potential for injury. It should be noted that many of the injuries seen following shoulder dystocia can also occur following normal vaginal deliveries and even caesarean section, (Sturdee et al, 2001).

Neonatal deaths secondary to asphyxia resulting from shoulder dystocia have not been a feature in recent papers. However, the Confidential Enquiry into Stillbirths and Deaths in Infancy (CESDI, Hope et al, 1998), reported on the findings of 56 cases of fatal shoulder dystocia occurring over a 2 year period in England, Wales and Northern Ireland. This confirms that, although rare, fatal shoulder dystocia does still occur with an approximate incidence of 0.04 per 1000 deliveries.

Shoulder dystocia is a common source of litigation since parents and their advisers find it difficult to accept that the problem could not have been predicted and circumvented. Claims can be difficult to repudiate and can result in large awards for damage, (Leigh & James, 1998).

CONCLUSION

Therefore it can be seen that shoulder dystocia is an important obstetric emergency that must be recognised and managed as soon as possible.

When the head of Mrs AN’s baby was delivered, the midwife saw the Turtle sign and acted on it as soon as she could, and mentally got the plan of action ready, so she could manage the patient appropriately. In my opinion, I feel that the management of Mrs AN was appropriate and correct. After speaking to the midwife later on, it emerged that although it was known that the baby was a big baby, shoulder dystocia was not anticipated and therefore nobody was prepared for the emergency.

As the labour was prolonged, and Mrs AN’s wasn’t progressing very well, it was decided to augment her labour with Syntocinon, Mrs AN agreed with this.

The choice of manoeuvre undertaken is the decision of the senior sister, and as in the case of Mrs AN
this was to adopt an all-fours position. An episiotomy was not carried out. The use of episiotomy is usually recommended in the literature, both when shoulder dystocia is anticipated and when it has occurred. It should, however, be appreciated that as the obstruction to shoulder delivery is at the pelvic inlet, rather than the soft tissues of the perineum, episiotomy itself does not overcome shoulder dystocia. On this basis, it has been suggested that can be resolved by external manoeuvres probably does not require an episiotomy, (Piper & McDonald, 1994).

It was very impressive to see the Royal London pneumonic for shoulder dystocia in action. As soon as the situation was recognised, the midwife got the student midwife to press the alarm to call for senior help. When the senior sister arrived, she immediately took over the situation and she knew exactly what to do. She got Mrs AN onto all-fours, which she thought was the most appropriate manoeuvre, (and it was), delivered the baby within the same minute although for one frightening moment, the team had thought that they would lose the baby. The paediatric SHO was present, ready to resuscitate if necessary. It was amazing to see the baby move and breathe. In fact the whole thing occurred so fast that if you didn’t know what was happening you would have missed it!

So in conclusion, it can be stated that shoulder dystocia is a rare but serious mechanical complication of vaginal delivery, which can be traumatic and at worst catastrophic. Certain factors may indicate the possibility of shoulder dystocia occurring, for instance in Mrs AN, the baby was a large baby, and also her labour was prolonged. However, most cases are unanticipated. All midwives and obstetricians should have a logical plan of action for managing the problem when it occurs. The Royal London has this plan of action on a poster on the wall, of every room on labour ward. Simple manoeuvres will resolve most cases rapidly while minimising the risk of fetal trauma. Unfortunately, injuries can be sustained by the neonate that are occasionally permanent; these often result in medico-legal action. It must be remembered that fatal outcome is rare.

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