Management of Shoulder Dystocia

Shoulder dystocia is not an uncommon obstetric complication, occurring in as many as 2 per 100 vaginal births. This obstetric emergency is associated with a number of adverse perinatal outcomes for both the mother and infant, the most serious of which remains neonatal brachial plexus injury. In a minority of cases in which there is prolonged impaction of the shoulders, birth asphyxia also may occur.

Obstetricians and other birth attendants must be fully prepared to effectively manage shoulder dystocia when it occurs. They also should understand the existing controversies regarding prevention and the pathogenesis of injuries associated with shoulder dystocia.

Shoulder dystocia generally is not a predictable event, which makes prevention extremely difficult. Because of the limited accuracy of ultrasound for estimating fetal size, the risk of shoulder dystocia and resulting injury must be fairly significant before prophylactic cesarean is considered as a preventive measure. There are, however, certain high-risk scenarios that call for consideration of prophylactic cesarean delivery.

Prevention

For the past several decades, clinical research has focused on whether shoulder dystocia can be predicted and/or prevented. Overall, most analyses have shown that shoulder dystocia can be only minimally predicted, at best, and that prevention of this complication as well as associated injury is far from a simple undertaking.

The leading risk factor for shoulder dystocia is excessive birth weight, yet not all cases of shoulder dystocia involve infants who weigh more than 4,500 g, or even more than 4,000 g. In fact, most shoulder dystocia cases actually occur when birth weights are less than 4,000 g—especially in nondiabetic pregnancies. (In diabetic pregnancies, most shoulder dystocias and brachial plexus injuries do occur in infants with birth weights greater than 4,000 g.)

The possibility that birth weight estimates may help us to predict and/or prevent shoulder dystocia also is hindered by the fact that it remains difficult to identify large babies prior to delivery. Clinical estimation of size and the use of ultrasound are the two most commonly employed techniques for estimating birth size, but both have limited accuracy and may either underestimate or overestimate fetal size. Most large babies, moreover, can successfully undergo vaginal birth without the complication of shoulder dystocia, let alone brachial plexus injury.

All told, these realities limit our ability to use estimated birth weight in selecting those pregnancies that might benefit from prophylactic cesarean delivery.

To consider prophylactic cesarean delivery, the level of risk for shoulder dystocia and resultant injury must be fairly significant. The following are two clinical scenarios in which the risk of complications reaches a level at which the option of prophylactic cesarean section (including informed consent) should be discussed with the mother:

- A pregnancy complicated by diabetes in which the estimated fetal weight is greater than or equal to 4,500 g. Some experts have suggested that this threshold should, in fact, be lower in diabetic pregnancies. However, utilization of a lower threshold (such as 4,000 g or 4,250 g) must come with the recognition that it will spur the use of more cesarean deliveries to prevent injury.

- A patient with a history of shoulder dystocia birth, particularly when the fetus is believed to be of similar or greater weight than the previously affected fetus.

Determining the recurrence risk of shoulder dystocia has proved difficult because, in most clinical series, a large proportion of women with a history of the complication will undergo scheduled cesarean delivery in their subsequent pregnancies. This bias toward operative delivery may lead to an underestimation of the true recurrence risk. Regardless of this potential limitation, studies that have assessed fetal weight in the woman’s current pregnancy is significantly less than that of the prior pregnancy, we should counsel women with prior shoulder dystocia and offer them prophylactic cesarean delivery.

With respect to the predictive value of labor abnormalities and studies that yielded mixed results. The bottom line is that labor abnormalities are not particularly useful in predicting shoulder dystocia—except for cases of a prolonged second stage of labor when there is suspicion of a large infant. This combination of factors should alert the physician to the potential for shoulder dystocia. Operative vaginal delivery should generally be avoided in this scenario, because delivery above an outlet station may further increase the risk of shoulder dystocia and resultant injury.

Management, Medicolegal Issues

As with any delivery, the goal of management should always be to deliver the infant as safely as possible, minimizing the risk of traumatic injury and birth asphyxia. In most cases of shoulder dystocia, the shoulders remain in an anterior-posterior position and fail to rotate. This creates the potential for brachial plexus injury as the nerves of the brachial plexus are stretched with the descent of the fetal head.

There is little objective study of the maneuvers employed for shoulder dystocia and their effectiveness in preventing neonatal injury, let alone prospective studies comparing the effectiveness of one maneuver versus another. The choice of maneuvers thus remains provider specific. The maneuvers that are most commonly employed for shoulder dystocia, however, are utilized in order to disimpact the anterior shoulder from behind the symphysis pubis by effecting its rotation.

It is important to appreciate that the McRoberts maneuver, with or without suprapubic pressure, may be successful in only approximately 50% of shoulder dystocia cases.

Unfortunately, many young obstetricians have had limited exposure to shoulder dystocia and may have employed only this maneuver, and not others, in their clinical training. At some point, they will likely encounter a shoulder dystocia case that does not respond to the McRoberts and/or suprapubic pressure maneuvers. It is critical to be competent in performing a full repertoire of potentially effective maneuvers.

There is increasing evidence that obstetricians should have a low threshold for utilizing delivery of the posterior shoulder in the management of shoulder dystocia.

In one recently published, multicenter review of shoulder dystocia maneuvers, for instance, investigators identified women who had incurred a shoulder dystocia during delivery and compared cases involving neonatal injury with injury-free cases. Delivery of the posterior shoulder was associated with the highest rate of successful delivery, when compared with other maneuvers, and with similar rates of neonatal injury (Obstet. Gynecol. 2011;117:1272-8).

The value of posterior arm release lies in its ability to reduce the anterior-posterior diameter of the fetus more significantly than any other maneuver. It has been associated with a marked decrease in anterior nerve stretch and the force required to effect delivery (Obstet. Contdued on following page
**DES Exposure Elevates Risk of 12 Adverse Outcomes**

BY MARY ANN MOON

FROM THE NEW ENGLAND JOURNAL OF MEDICINE

Intrauterine exposure to diethylstilbestrol was associated with a high lifetime risk of a broad spectrum of adverse outcomes in a follow-up study of patients now in their 40s, 50s, and 60s.

Most of these risks were increased by a factor of more than two, compared with the risks in women of the same age who were not exposed to diethylstilbestrol (DES), said Dr. Robert N. Hoover of the National Cancer Institute, Bethesda, Md., and his associates. Although DES has not been prescribed for pregnant women in the United States for 40 years, adverse outcomes continue to occur in women exposed in utero, and continued monitoring ... for established and unexpected adverse outcomes seems prudent,” they noted.

In the early 1990s, Dr. Hoover and his colleagues combined three cohort studies of DES-exposed women that had begun in the mid-1970s, so that the pooled subjects could be followed periodically with self-report questionnaires. Their Combined Cohort Study of DES Exposure involved 4,001 DES-exposed women and 1,683 nonexposed control subjects from the original cohorts, who were born between the late 1940s and the early 1960s and whose average age at last follow-up was 48 years.

Twelve adverse health outcomes were significantly associated with DES in previous studies were assessed in the combined cohort, and all 12 were found to be significantly associated with DES in this combined analysis.

The hazard ratios (HRs) associated with DES exposure, compared with nonexposure, ranged from a low of 1.42 for preeclampsia to a high of 8.12 for neontal death (usually related to preterm delivery). In ascending order, the HRs were 1.64 for spontaneous abortion; 1.82 for breast cancer diagnosed at age 40 or older; 2.28 for cervical intraepithelial neoplasia of grade 2 or higher; 2.37 for early menopause; 2.45 for stillbirth; 3.72 for ectopic pregnancy; 3.77 for loss of second-trimester pregnancy; and 4.68 for preterm delivery, the investigators wrote (N. Engl. J. Med. 2011;365:1304-14).

DES-exposed women who had clinical evidence of vaginal epithelial changes at a young age — a marker of high DES dose and exposure early in gestation — were found to have significantly higher risks for adverse outcomes than did exposed women who showed no vaginal epithelial changes. This finding provides additional support for the argument that DES exposure caused, and was not just linked to, the adverse outcomes, they said.

The researchers also calculated the excess risk of adverse outcomes that could be attributed directly to DES exposure. This excess risk was 1.7% for breast cancer, 3.4% for early menopause, 3.5% for CIN, 6.3% for stillbirth, 7.2% for neontal death, 11.7% for both spontaneous abortion and ectopic pregnancy, 12.7% for preeclampsia, 14.7% for loss of second-trimester pregnancy, 17.8% for infertility, and 35.4% for preterm delivery.

The Combined Cohort Study of DES Exposure was supported by the National Cancer Institute. Dr. Robboy reports receiving consulting fees from UCB, Belgium. Dr. Karlan reports holding stock in and receiving board membership fees from IRIS International. Dr. Hatch receives royalties as a reviewer of the DES card on the UpToDate medical information site.