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Gynecol. 2003;101:1068-72; Am. J. Obstet. Gynecol. 2010;203:339.e1-5).

In many litigated cases involving shoulder dystocia and brachial plexus injury, it is asserted that unnecessary excess traction must have been employed for a permanent injury to have occurred. Such assertions imply that the obstetrician can perfectly gauge the amount of traction or force necessary to deliver the infant and yet avoid injury in the setting of shoulder dystocia, which is not the case.

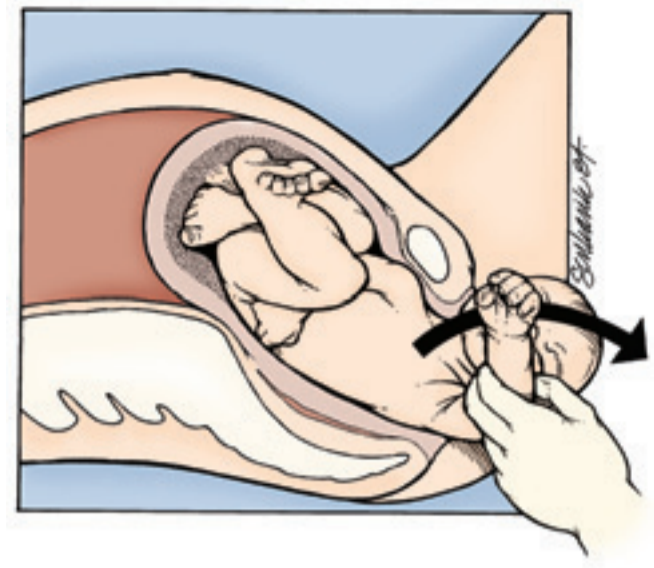
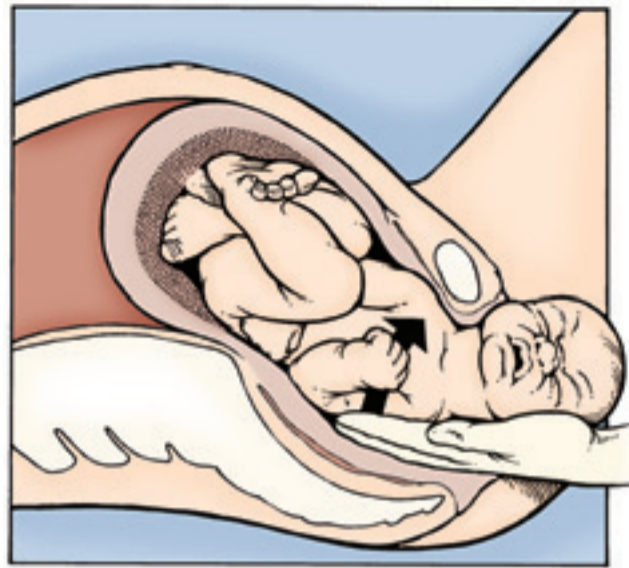
Increasing evidence suggests that many cases of brachial plexus injury accompanying shoulder dystocia are multifactorial in origin, and are not simply a result of operator-induced traction and stretching of the nerves. Obstetricians are continually instructed early on in their careers that excess traction should be avoided, as should any fundal pressure that might further disimpact the shoulders.

I simply recommend abandoning any traction efforts once shoulder dystocia is clearly recognized. When the complication occurs, a team consisting of additional nursing personnel, anesthesia, and the most experienced obstetrician available should be immediately summoned, and expulsive efforts on behalf of the mother should be curtailed while maneuvers are being undertaken to disimpact the shoulders.

If two obstetricians are present, it often is helpful for the stronger of the two to deliver appropriate suprapubic pressure from above. The goal is to move the shoulders to an oblique position by exerting pressure from the back of the fetus. This maneuver cannot really be done effectively by a single operator or from below as has been depicted in some textbooks. Again, if this fails to work, a low threshold should exist for attempting a posterior arm release.

Maintaining accurate documentation in the medical record of all events preceding and surrounding the shoulder dystocia is important. This includes but is not limited to the following:

- ▶ Consideration of significant risk factors for macrosomia, including diabetic pregnancy management and results of gestational diabetes screening tests.
- ▶ Estimation of fetal size, either clinically or by ultrasound. Most experts believe that diabetic mothers should undergo ultrasound at term to assess fetal size.
- ▶ Description of instrumental delivery, including indication and station at application and duration of use.
- ▶ A detailed step-by-step description of the maneuvers



The doctor inserts a hand (left), then he/she sweeps the arm across the baby's chest and over the mother's perineum.

used to disimpact the shoulders. The anterior shoulder should be identified as part of the documentation.

Training and Simulation

During the past few years, simulation and drills and other enhanced teaching methods have become an increasingly common part of the curriculum for training residents and nursing personnel in the management of shoulder dystocia. Because the complication occurs relatively infrequently but can have devastating consequences when it does, shoulder dystocia is one of only several obstetric emergencies to be targeted in efforts to improve patient safety.

As with the few other obstetric events that receive such attention, data on the impact of enhanced training on perinatal outcomes remain limited. There clearly is evidence that simulation and drills improve team performance, and it has been hoped that improved team performance will ultimately translate to better outcomes. At present, two studies have indicated that the incidence of brachial plexus injury may decline with the implementation of targeted training for maternity staff.

One of these studies retrospectively compared the management and neonatal outcomes of almost 20,000 births that were complicated by shoulder dystocia in the years before and after the introduction of shoulder dystocia training for all maternity staff in a hospital in the United Kingdom (Obstet. Gynecol. 2008;112:14-20). The rate of brachial plexus injury at birth was significantly reduced, from 7.4% to 2.3%, as was the rate of neonatal injury more broadly (from 9.3% to 2.3%).

In the other study – also a retrospective assessment – the rate of obstetric brachial plexus injury in cases of shoulder dystocia fell from 30% before a training protocol was implemented for maternity staff at Jamaica Hospital in New York, to 11% afterward (Am. J. Obstet. Gynecol. 2011;204:322.e1-6).

A recently published study from Ireland, however, failed to reveal any difference in the frequency of brachial plexus injury after the introduction of specific staff training in managing shoulder dystocia. In this single-hospital study, investigators assessed outcomes associated with more than 77,000 deliveries that occurred during two 5-year time periods, before and after training was instituted. The incidence of brachial plexus injury remained unchanged from 1.5 per 1,000 in 1994-1998 to 1.7 per 1,000 in 2004-2008 (Am. J. Obstet. Gynecol. 2011;204:324.e1-6).

Although the results of this latter study are disappointing, I believe they are unlikely to limit the enthusiasm for the simulation training and shoulder dystocia drills that have become fairly routine in many large maternity hospitals in the United States.

Regardless of the limited outcomes data we have available thus far, experience with simulation training has taught us that in order to retain necessary skills, repetitive participation in simulation training appears to be required. The relatively infrequent nature of severe shoulder dystocia cases makes the simulation model for learning very attractive. ■

Dr. Landon reported that he has no relevant financial disclosures.

DES Exposure Elevates Risk of 12 Adverse Outcomes

BY MARY ANN MOON

FROM THE NEW ENGLAND JOURNAL OF MEDICINE

In-utero 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 that 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 neonatal 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; 2.35 for early menopause; 2.37 for infertility; 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 neonatal 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. ■