NIH Panel Urges Fewer Cesarean Births

The "once a cesarean, always a cesarean" dictum is not valid

A task force* convened by the National Institutes of Health to consider indications for cesarean childbirth concluded that many women who currently are offered no options other than cesarean deliveries should be allowed to choose vaginal deliveries. The recent precipitous rise in the rate of cesarean deliveries is "a matter of concern" and it can be halted and possibly even reversed, the task force said. In the past 10 years the rate of cesarean deliveries in this country has tripled, from 5.5 to 15 percent, and the rate is still increasing.

One rationale for the increase in cesarean deliveries is that doctors and parents want to be sure that babies are not just born alive but are born well. If any factor such as prolonged labor, fetal distress, or breech position puts the fetus at risk during labor, the tendency has been to quickly perform a cesarean delivery. Task force member Robert B. Hilty of Kettering Medical Center in Dayton, Ohio, explains that obstetricians also fear lawsuits if they decide against a cesarean delivery and a less than perfect child is born. "We're trying to prevent morbidity, which we don't know is going to happen. We have just a few minutes to make a decision and we also have the problem of the medical-legal atmosphere," he says. Yet task force member Barbara Katz of the University of Massachusetts in Boston reported at the meeting that these fears of lawsuits are overblown. In most such cases that were brought to court, the physician was not found to be liable.

But even if physicians are on firm legal ground if they choose not to perform a cesarean when it is not clear that it would be advantageous to the child, there remains the problem of deciding what method of delivery is best. Here the task force foundered. Over and over again, members of the group said they had only mortality data to go by. No morbidity data and, in particular, no data on brain damage are available. Task force chairman Mortimer Rosen of Case Western Reserve University repeatedly explained that no test in the world can predict the future mental performance of a newborn baby. To get data on brain injury, researchers will have to follow children for years after they are born.

The panel's most surprising and most specific recommendation was that many women who previously had cesarean deliveries should be offered an opportunity to choose vaginal deliveries for subsequent babies. Currently, 99 percent of women who have had a cesarean are automatically given cesareans in all future deliveries. Repeat cesareans account for 25 to 30 percent of the increase in cesarean birth rates.

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The reasoning behind the "once a cesarean, always a cesarean" dictum dates back to early in this century, when cesarean deliveries were performed by making a vertical incision in the woman's abdomen. The scars from these operations were likely to rupture if subjected to the forces of labor in subsequent deliveries. If a scar ruptured completely, the baby could die within 5 minutes and the woman could die from hemorrhage and shock or, if she lived, might require a hysterectomy.

Several decades ago, physicians began to abandon the vertical incisions in favor of horizontal incisions low on the abdomen. These incisions, the task force reported, are very unlikely to rupture under the strains of labor and a vaginal delivery. Rosen estimates that only 40 in 100,000 women will have even partial rupture of these scars and that scars that do rupture rarely rupture completely, meaning that the baby can still be safely delivered by cesarean and the mother will neither die nor need a hysterectomy. Rosen explains that "The risk of a cesarean is very close to the risk of rupture [of a previous incision]." About 10 of 100,000 women who have cesarean deliveries die, which is twice the death rate for vaginal deliveries. Cesarean deliveries also carry a greater risk that the mother will develop a nonfatal infection after delivery.

The task force attached two provisos to its recommendation that women who have had cesareans be allowed a trial of labor in subsequent pregnancies. First, it stated that the women must have had low, horizontal incisions when they had their cesareans. Second, the hospital must have appropriate facilities available for immediate termination of labor. Rosen defined appropriate facilities as meaning that the woman should be able to get to an operating room within 15 minutes, and preferably within 6 minutes, should her scar start to rupture.

Another case in which there is room for a decrease in cesarean deliveries is that of women with prolonged or difficult labor—a diagnosis that accounts for about 30 percent of the rise in the cesarean delivery rate in the past decade. The task force reported that there seems to be no survival advantage for babies delivered by cesarean, rather than vaginally, because of difficult labor, but that morbidity data are not available. It recommended that physicians consider measures such as sedating the woman, stimulating her uterine contractions with oxytocin, or having her walk about to facilitate labor. According to Rosen, "It's clear that [the incidence of prolonged or difficult labor] has gone up so much that there must be overdiagnosis. But we're not sure which cases should be delivered vaginally."

In 1970 fewer than 12 percent of fetuses in breech presentation—buttocks or feet, rather than head, first—were delivered by cesareans. Now more than 60 percent are. The task force concluded that term fetuses in breech presentation can be delivered vaginally when the fetuses weigh less than 8 pounds, the physician is experienced in breech deliveries, the woman has a normal pelvis, and the fetus's head is not bent back. For premature breech babies, it is not clear whether vaginal or cesarean deliveries are safer.

About 10 percent of all cesarean deliveries are being done because of a diagno-

*The task force made its recommendations at a consensus conference on cesarean childbirth that was held on 22 to 24 September and was sponsored by the National Institute of Child Health and Human Development in conjunction with the National Center for Health Care Technology.

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sis of fetal distress. In such cases, it appears that the fetus is being deprived of oxygen and is at risk of brain damage. With the advent and widespread use of the electronic fetal monitor in the past decade, diagnosis of fetal distress has become more common. But it is still difficult to decide whether fetuses are distressed. The task force felt it had insufficient data on mortality and morbidity to recommend decreasing the number of cesareans done for fetal distress.

With the increasing popularity of prepared childbirth classes, nonmedicated childbirth, the presence of husbands in delivery rooms, home births, and hospital birthing centers, many couples look forward to idealized vaginal deliveries and feel cheated and disappointed by cesarean deliveries. Recognizing this, the task force recommended that childbirth classes discuss the possibility of cesareans and that hospitals consider allowing fathers in operating rooms to observe cesarean deliveries. The task force also recommended that hospitals reconsider the practice of routinely separating healthy babies delivered by cesarean from their parents so that the babies can be observed in special nurseries.

In the final analysis, however, the task force could make specific recommendations only about repeat cesareans. "Somewhere along the line we have to look at the morbidity issue," Rosen says. Until then, the task force is somewhat shackled in its attempts to discourage cesarean deliveries.

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Transplants (II): Altering the Donor Organ

Culturing, use of fetal tissues make it less likely that donor organ will provoke an immune reaction

Most approaches to prevention of rejection of the donor organ in transplants have usually involved suppressing the recipient's immune system. Some of the newer techniques (*Science*, 3 October, p. 44) promise selectivity in immune suppression so that the transplanted organ will not be rejected, but the recipient will retain enough immune function to fight off virulent infections.

An alternative approach is to work with the donor organ in an attempt to reduce its immunogenicity (ability to stimulate an immune reaction). The two most common ways to do this have been to culture the organ before transplantation and to use fetal tissues as the donor. These methods, when used in conjunction with some of the techniques discussed previously, could make it possible to transplant organs that have been exceptionally difficult to work with in the past.

Culturing as a transplantation technique was very nearly discredited 6 years ago when William T. Summerlin, then of the Sloan-Kettering Institute in New York City and the foremost advocate of culturing, was accused of fabricating some research results and misinterpreting others. Summerlin had claimed that simple in vitro culture of skin, corneas, and certain other tissues for periods of 1 to 2 weeks changed the tissues somehow so that they could be transplanted across immunological barriers without rejection. Other investigators were not able to reproduce Summerlin's findings, but there were enough successful results with other kinds of culturing to keep a few investigators busy exploring the concept.

In 1975, Kevin J. Lafferty of the Australian National University in Canberra and David W. Talmage of the University of Colorado Medical Center in Denver reported that thyroid glands could be transplanted across immunological barriers in mice if the glands were first cultured for 12 days at 37°C in a controlled atmosphere consisting of 95 percent oxygen and 5 percent carbon dioxide. During the culture period, they observed, the thyroid tissue retained its structural integrity, but leukocytes (white blood cells) trapped in the tissue gradually disappeared. They concluded that it is these passenger leukocytes that initiate the rejection of uncultured thyroid tissue, and that the antigens on the thyroid itself are relatively weak immunogens. As support for this hypothesis, they note that injection of the organ recipient with leukocytes from the donor leads to rejection of a previously stable thyroid graft.

Subsequently, Lafferty and, independently, H. W. Sollinger and his colleagues at the University of Wisconsin at Madison have shown that thyroid tissue can be transplanted from rats to mice by culturing in this manner. Lafferty has also shown that the parathyroid gland can be transplanted across major immunological barriers in mice after it has been cultured, and Clyde F. Barker and his associates at the University of Pennsylvania School of Medicine in Philadelphia have achieved similar results with the parathyroid in rats.

These findings support the belief of some investigators that classical endocrine tissues (which produce hormones) are less immunogenic than exocrine tissues (all others). Talmage, meanwhile, has found that length of the culture period can be drastically reduced by increasing the partial pressure of oxygen in the incubator, since lymphocytes are very sensitive to oxygen. The culturing time can also be shortened by treating the donor, before the tissue is surrendered, with cyclophosphamide, a drug that kills rapidly proliferating cells, such as lymphocytes.

Lafferty and Talmage's technique has been adapted by Richard Hong of the University of Wisconsin and Erwin W. Gelfand of the University of Toronto to treat children with severe combined immunodeficiency disease (SCID), an inborn defect that leaves the children highly susceptible to infection. Gelfand's approach is to obtain thymic tissue from a donor, mince it, and grow it in an incubator for 14 to 21 days under conditions similar to those used by Lafferty. This allows growth of thymic epithelium with loss of T lymphocytes.

He then extracts segments of growing tissue from the culture and injects them in the SCID children. Within about 6 to 8 weeks after the transplant, immune function is established in some of the children, allowing them to live a normal life for the first time. Of special importance, Gelfand notes, is the fact that the cultured tissue rarely produces graft versus host disease—a condition where lymphocytes produced by the donor tissues attack the recipient's tissues—and which

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