CRANIOTOMY

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THE subject of craniotomy is one infrequently chosen by an essayist, yet its importance as an obstetric operation seems to thoroughly justify its consideration and discussion from time to time.

There are two or three reasons why this subject is not more often brought before medical societies, among them being the fact that the operation carries with it a certain gruesomeness which is not without its effect upon the operator and his assistants and audience; no obstetrician cares to perform this operation especially and has no desire to be known as an expert in this line. Then there are certain well-known religious views which are in opposition to craniotomy under a great many conditions.

Nevertheless it is not well that any of these reasons should be allowed to place this important obstetric procedure so far in the background that it is in danger of being overlooked.

I am sure there is no one of any considerable experience in obstetrics who has not frequently known of cases where good opportunity and indications were present for craniotomy, but where the operation was seemingly entirely overlooked. Then again we are all aware of many cases where craniotomy has been done quite needlessly.

With my chief purpose in offering this subject for consideration being to emphasize first that craniotomy should be done in many cases where it is not done, and secondly should not be done in many cases where it is being done, I shall first of all discuss the indications.

In all cases where the fetus is dead and delivery is not progressing quite rapidly and easily, there is no doubt whatsoever about the propriety of craniotomy, except in that rare instance where we have to deal with a large child and a true conjugate of 5 or 6 cm. or less.

There is no excuse for the application of forceps to the head of a dead child. Neither do we feel that a version on a dead child is ever indicated. In case the child is dead and for any reason it seems desirable to aid in the delivery, it is far better for the mother, and in this instance she is our only patient, that we should first of all perforate and reduce the size of the head.

In this connection I desire to quote from DeLee[1] in his discussion of the impropriety of forceps or internal podalic version delivery of a dead child.

when he said it has a place in obstetrics he also said something that every one of us should recognize.

DR. JAMES E. DAVIS, DETROIT, MICHIGAN.—I want to say a word about postmortem pubiotomy, when evisceration is to be done quickly. The technic should be simple and effective. Erdheim, of Vienna, uses the edge of a knife in palpating for the line of synthesis, then the blade is driven through the union by a few successive fist blows upon the back of the knife, only a few seconds being required for the execution of the work. If this type of operation is indicated the simplicity and effectiveness of this technic is to be recommended.

DR. QUIGLEY.—I would like to ask two questions, one the average amount of space he obtains, and the other how long does it take to do the operation.

DR. LEIGHTON.—I would like Dr. Bill to mention the after-care of these cases, the time for recovery, and the lack of union, and the possibility of sepsis.

DR. BILL (closing).—In regard to the general status of pubiotomy, I think I have made myself perfectly clear that I consider it an emergency procedure, and I will agree with Dr. Leighton that if the prenatal care had been perfect, and that if the proper care had been followed during the course of labor as outlined in the paper, these indications would not arise.

In answer to Dr. Quigley, I will say that I made some experiments at one time with the bony pelvis in regard to the expansion and concluded that it was not best to try to get a separation of more than two fingers' breadth between the ends of the bones; when greater separation was caused there was considerable elevation along the anterior surface of the ilium and sacrum, that is the anterior sacroiliac ligament, and there was a possibility I think of some loosening of the sacroiliac joint. Up to that point I did not find that it occurred. I made these experiments on the pelvis by taking blocks of wood, held together by a turn buckle of which the conjugate diameter could be increased to varying degrees, and the separation of the pubic bones and elevation along the sacroiliac point determined. I have been able to insert two fingers between the ends of the bones in clinical cases.

With regard to convalescence, I have kept these patients in bed three weeks. You do not get bony union in most cases; there is, however, a firm, fibrous union. Three weeks is the average length of the convalescence.

With regard to the after-care, it is not as smooth as that of cesarean section. That is one of the disagreeable things about it, and that is one reason why we consider it an emergency operation. But I will say this: I had one patient who did not know that she had a pubiotomy performed until her husband told her two months afterward. She knew that her pelvis was bound with adhesive plaster, but did not suspect that anything like a pubiotomy had been done. After all, the convalescence was not so bad. So far as the kind of union of the pelvis is concerned, there is little difference in the functional result.

In the literature there are cases of sepsis reported. In my own experience the results have been good. There are cases of sepsis after craniotomy; there are other cases in which sepsis has developed after forceps. As I see it, a well performed pubiotomy has no direct connection with the sepsis which is present in these cases nor does it add materially to the danger of infection.

DR. HALL.—You cannot say that with reference to craniotomy?

DR. BILL.—A certain percentage of craniotomies is followed by sepsis.

only its head, is nothing more than a foreign body and should be handled merely as such; that when the baby dies we have one and only one patient and all our efforts should be concentrated toward the conservation of the life and health of that one patient.

As to craniotomy upon a living child, many questions of doubt arise. It is not difficult to find many excellent authorities who find many indications for craniotomy when the child is still living.

First of all, and probably most frequently of all these borderline cases, is that of the hydrocephalic child. In the minds of most obstetricians there is little hesitancy in recommending a perforation where the diagnosis of hydrocephalus can be made with at least a high degree of certainty.

In our present position of being unable to give more than a very serious prognosis as to life or mental and physical development of the hydrocephalic and with a thorough appreciation of the great weight upon relatives and society by the presence of the ordinary case of hydrocephalus, it would seem that craniotomy is a legitimate and merciful operation in every case where consultation of medical men points to a definite diagnosis of hydrocephalus and at least where the size of the head seriously jeopardizes the mother. Certainly no mother's life should be hazarded to the extent of a cesarean section with reasonable assurance that the child to be obtained is afflicted with hydrocephalus. Then along with hydrocephalus should be mentioned a great many of the monsters with which we may come in contact, though it is more seldom that we are able to make the antepartum or intrapartum diagnosis. If the diagnosis can be made prior to delivery and especially if confirmed by the x-ray, no attempt at cesarean section, internal podalic version, or forceps on such a case that is offering any serious degree of dystocia should be made.

No hesitancy should be felt in perforating the head of a child prior to viability in all cases where rapid delivery seems imperative. In this class should be mentioned eclampsia, placenta previa, premature separation of the placenta, toxemia, nephritis, or other constitutional disease of the mother. Often in cases of spontaneous miscarriage a rigid cervix very greatly delays the labor when perforation alone would promptly end a hard and painful and sometimes dangerous ordeal for the mother.

Lastly in considering the indications for craniotomy should be mentioned that rather a large group of cases where the child may still be living but where its ultimate survival is in great doubt regardless of how delivered and where any other operation greatly increases the risk of the mother. In this group should be mentioned those cases where uterine sepsis exists. In regard to this question I desire to quote Newell,[3] who says:

"No method of abdominal delivery is safe in cases of virulent infection of the uterus, and therefore, in these cases abdominal delivery is to be avoided, if delivery can be otherwise accomplished, craniotomy being the operation of choice in cases in which no other method of delivery through the pelvis is possible, even though the child be alive. The maternal mortality following craniotomy even on infected cases, is less than that following any other similar abdominal operation under similar circumstances, and the chances of the child, even if delivered by cesarean section, under these conditions, are rather poor, many children dying of infection a few days after birth. Therefore, the operator should not consider the interests of the child, but should perform craniotomy if the pelvis is large enough for the delivery of a mutilated child."

Williams[4] likewise states that:

"Although it must ever be the duty of the obstetrician to do his best to save the life of both mother and child, it is nevertheless conceivable that conditions may arise under which craniotomy upon the living child may not only be perfectly justifiable, but even imperatively demanded. . . . . If the mother is not seen until she has been in the second stage of labor for considerable time, and is already infected, classical or extraperitoneal cesarean section, as well as pubiotomy, is clearly contraindicated. In such cases the child should be sacrificed in the interests of the mother, as the only other safe method of delivery consists in cesarean section followed by hysterectomy, which inevitably entails complete abolition of the reproductive function. Again, if the child is in poor condition, as shown by a too rapid or too slow heart beat, or by the passage of considerable quantities of meconium with a vertex presentation, its life is already in such peril that, against that of the mother, it is no longer entitled to serious consideration. Moreover, in country districts, where the physician is unable to summon sufficient assistance, and is without the necessary appliances for an aseptic operation, cesarean section or pubiotomy should not be undertaken and craniotomy becomes the operation of choice."

It would seem that there is but one solution to the problem of religious belief. In all cases where the best obstetrics seems to be the operation of craniotomy on a living child, then the relatives or friends concerned should have all the facts carefully placed before them. After we have attempted to explain to them the *pros* and *cons*, we can only abide by their decision, but our full duty to them has not been discharged until we have requested permission to perform craniotomy. In the handling of charity cases it is usually the rule to have all applicants for treatment in the maternity hospitals sign a statement which leaves all question of treatment to the hospital and in these instances the question of further permission is not necessary. But it is always well to know that such a permit has been signed or that proper permission has been obtained before beginning the operation of craniotomy.

Before resorting to craniotomy on a living child we should bear in mind that the extraperitoneal section as practiced by Davis and McPherson seems to offer a method of delivering the potentially infected cases with a high degree of safety; and those authorities who are advocating the low cervical section after transverse incision in

the peritoneum and deflection of the bladder downward are obtaining results which bid fair to greatly reduce the indications for destruction of a living child.

As to the mortality of the operation of craniotomy, statistics vary widely. Dr. T. W. Markoe a few years ago published some records showing 12½ per cent mortality, but maintained that death was nearly always due to conditions present before beginning the operation or to the method of performing it and that such a high mortality was by no means necessary. DeLee[5] says: "There should be no mortality from craniotomy if it is properly carried out."

In a report several years ago by Voorhees[6] upon 96 craniotomies in the Sloane Maternity, there was a maternal mortality of 26.4 per cent; but the author calls attention to the fact that practically half these deaths were due to eclampsia and that many of the other cases were moribund from various causes when the operation of craniotomy was begun. No deaths could be attributed directly to the operation itself.

Among the contraindications to craniotomy might be mentioned first of all a pelvis so markedly contracted as to offer a true conjugate of less than 5 or 6 cm., as in such cases with an average sized child there will be experienced marked difficulty in effecting the delivery and it may be quite impossible of accomplishment.

A previous craniotomy should stand out very strongly as a contraindication to a second one. In other words no obstetrician is at all excusable if he allows a patient in his charge to reach the stage needing a craniotomy the second time at least for pelvic disproportion. The previous craniotomy should be a warning signal, and a timely version or cesarean section should be performed in order to avoid the necessity of further loss of life. Then possibly there are a few cases of pelvic tumors or cervical disease or scars which offer insurmountable obstacles to craniotomy.

In preparing for this operation in addition to the usual antiseptic precautions there are at least a few conditions which should be fulfilled. The cervix should be fairly well dilated or easily dilatable, though of course the size of the fetal head is to be greatly reduced and full dilatation is not of the same importance as in an ordinary forceps delivery. Yet, if the craniotomy is done as we often see it done and if some of the obsolete instruments are used that are still being used, there is grave danger of serious injury to a cervix which is not well dilated.

Catheterization as in all obstetric operations is of very great importance. One of my cases gave me a very lasting impression of this, in that catheterization relieved me of possible blame for an injury which was present before I began the craniotomy. The catheter passed into the meatus properly but entered the vagina

through a large laceration produced in attempts at forceps delivery before the patient came under my care.

Then unless the head is low down or very firmly impacted it is always well to have an assistant hold it firmly through the suprapubic region while the operator perforates, as it sometimes moves about to such a degree as to markedly increase the difficulties and dangers.

As to the instrument of choice it seems that most operators prefer the Tarnier basiotribe. It offers a triple combination of an excellent perforator, crushing apparatus and tractor all in one instrument and in my own experience is far superior to any other device. In addition to having the triple combination in one instrument the Tarnier basiotribe greatly reduces the probability of injury to maternal soft parts by splinters or edges of cranial bones and rarely ever slips off.

Once the perforator has entered the cranial cavity it should be carefully but positively introduced down to the medullary portion of the brain and moved about in such a manner as to quite completely destroy the vital areas of the brain or the very disconcerting condition may arise of having the child delivered still alive. I have seen two cases in which perforation had been done and the head markedly crushed and still the babies made efforts to breathe after delivery. Authentic cases are on record of the babies living for hours and even days and one case lived for years as an idiot.

Within the past few months a case was brought to my attention where the perforator had been introduced and the baby delivered by high forceps; the child is now alive and well at two years of age. The child only shows a small scar over the area of the anterior fontanelle and to my mind it is altogether likely that the perforator was inserted between the scalp and cranium and that the cranial cavity was not entered, yet these cases serve to illustrate what may happen and to warn us against depending on mere perforation. The fingers should always be a guide for the perforator and an attempt should be made to perforate near the pubis as this will reduce the dangers of injury to the mother. In using the Tarnier basiotribe an effort should always be made to insert the perforator deeply and to apply the blades high on the sides of the head in order that the possibility of their slipping off may be reduced to a minimum. Also it is well to screw the locking device down quite firmly as in doing so the head is being reduced in size and the dangers of the instrument slipping off are still further reduced.

SUMMARY

1. Craniotomy is an operation we should have no hesitancy in deciding upon in all cases where the child is dead and there are no insuperable obstacles to pelvic delivery of the mutilated child.