A CLINICAL DISCUSSION

ON

THE CÆSAREAN SECTION: AND ITS CLAIMS AS AN OPERATION OF ELECTION.*

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Cases of Craniotomy in Extreme Distortion of the Pelvis.

CASE I.—I was requested on March 17th, 1843, to visit Mary M., aged 26, a very rickety woman. She had been married eighteen months, and had reached the full term of her first pregnancy. She had been in labour thirty-two hours; the membranes had been ruptured twelve hours; the os uteri was dilatable; the head was at the brim of the pelvis, with the scalp somewhat swollen. On examination, the pelvis was found greatly deformed. As the skin was hot, the pulse 98 and feeble, and she complained of thirst, the tongue dry and furred, and the pains were beginning to flag, the head was at once perforated. I succeeded in about two hours and a half, and with great difficulty, in extracting a male child of average dimensions. Shortly after delivery, she was seized with symptoms of peritonitis, of which complaint she died in thirty-two hours.

POST MORTEM EXAMINATION.—The peritoneum was highly vascular. Lymph and serum were effused in considerable quantities in the abdominal cavity. The uterus and surrounding tissues were matted together by recent adhesions. There was no trace of rupture. The other viscera were healthy. The admeasurements of the pelvis were the following.

Brim: Conjugate (true) diameter, $2\frac{1}{2}$ inches.

Transverse diameter, $4\frac{1}{2}$ inches.

Outlet: Conjugate diameter, $4\frac{1}{2}$ inches (coccyx pushed back).

Transverse diameter, $3\frac{1}{2}$ inches.

The cavity of the pelvis was lessened in all its diameters by straightness of the sacrum.

CASE II.—Mary M., aged 24, a dwarf, 4 feet 2 inches in height, single, had reached eight and a half months of her first pregnancy on April 3rd, 1848, when labour came on. The pains had continued with considerable severity for twenty-eight hours when I first saw her, at the request of Dr. Wildbore. The os uteri was fairly dilated and dilatable; the membranes had been ruptured about sixteen hours; the head at the brim. The pelvis was so much distorted in all its diameters, that I was induced to suggest the Cæsarean section, more especially as the child was alive. It was eventually decided to perforate the head, and, as there were no urgent symptoms, to leave the case for a time to the efforts of nature. At the end of fourteen hours, and under the influence of strong and oft-recurring pains, the head was pressed into the brim. The extraction of the head and body was effected, with great difficulty, in about four hours, when she was much exhausted. She never rallied, and died in twenty hours after labour.

POST MORTEM EXAMINATION.—The peritoneum was slightly injected. There was no inflammatory deposit in the abdomen. All the viscera were healthy. There was no rupture of the uterus or vagina. The dimensions of the pelvis were as follows.

Brim: Conjugate (true) diameter, $2\frac{1}{2}$ inches.

Transverse diameter, $4\frac{1}{2}$ inches; available space, $1\frac{1}{2}$ inch.

Outlet: Conjugate diameter, $3\frac{1}{2}$ inches.

Transverse diameter, $3\frac{1}{2}$ inches.

The cavity was reduced in all its dimensions.

CASE III.—Some years ago, I was sent for by Drs. Ayling and Chapman to see Mrs. D., aged 32, who was much deformed by rickets. At the time of my visit, she had been in labour thirty hours without any advance of the presenting head, which was above the brim. As her system was beginning to suffer, I applied Nægele's long forceps, with the view of steadying the moveable head, prior to perforation. After pulling a short time, I was surprised to find the head descending; and I succeeded in delivering her, without the use of the perforator, of a full-grown child, in an advanced state of decomposition. She made a good recovery, became again pregnant, and was delivered naturally about the sixth month, after many hours of severe suffering. For the third time she became pregnant, went to the eighth month, when labour was induced. After many hours of severe labour, craniotomy was performed,

and extraction effected with great difficulty. She never rallied, and died in thirty-two hours, with symptoms of ruptured uterus.

POST MORTEM EXAMINATION, by Dr. Andrews.—There was much fluid and coagulated blood in the cavity of the abdomen. A large rent extended across the upper part of the vagina, running upwards and backwards to the right side, and through the cervix uteri. The pelvis measured as follows.

Brim: Conjugate diameter, $2\frac{1}{2}$ inches.

Transverse diameter, $3\frac{1}{2}$ inches.

Oblique diameter, $4\frac{1}{2}$ inches.

Outlet: Conjugate diameter, $2\frac{1}{2}$ inches.

Transverse diameter, $3\frac{1}{2}$ inches.

CASE IV.—Dr. Murphy's First Case of Great Distortion of the Pelvis.

—M. A., a dwarf, 4 feet 1 inch high, was taken in labour with her first child at 12 o'clock on November 22nd. The labour continued until 3.30 of the 23rd, when "no advance" had been made. At 5 o'clock in the afternoon of the next day, she was first seen by Dr. Murphy, who at once detected great distortion of the pelvis. "The os uteri dilated to rather more than the size of a teacup, thick and tender; the head protruding through it, with the bones strongly overlapped." Owing to the child being dead and putrid, he determined to perform craniotomy, which was easily effected. "With great care and equal difficulty, the head was brought into the cavity of the pelvis; but no force could advance it farther. At length, after several efforts, the head separated from the neck." After great difficulty, owing to "the abdomen of the foetus being enormously distended with flatus", the arms and rest of the body were "at length extracted". "This patient was altogether fifty-three hours in labour", "very much exhausted and depressed", and "had some bronchitis"; "sank on the morning of the 26th", "twenty hours after delivery", "of shock to a constitution already diseased".

POST MORTEM EXAMINATION.—There were evidences of bronchitis, very limited incipient lobular pneumonia, and kidney-affection. There was no trace of inflammation in the uterus or peritoneum. There was ovate deformity of the pelvis, the conjugate diameter of which was $2\frac{1}{2}$ inches. For further particulars, see *Dublin Quarterly Journal of Medical Science*, May 1864.

CASE V.—Dr. Murphy's Second Case.—S. H., aged 25, of low stature, was taken with the premonitory symptoms of labour during the evening of January 5th, 1864. Severe and regular pains set in on the 6th, and continued up to 4 P.M. on the 8th, when craniotomy was performed by the practitioners in attendance. "After two hours' unsuccessful efforts" at delivery, she was sent to University College Hospital at 10 P.M., when she was first seen by Dr. Murphy, who immediately detected extreme deformity of the pelvis, "the broken bones occupying the brim". There was much difficulty in applying the crotchet, with which "immense force" was exerted, when the head was "advanced very slowly". "The operation occupied two hours", after which she was "very much exhausted". She continued to progress fairly well until the 13th, when "some symptoms of bronchitis" set in, which were much increased on the following day, "with great difficulty of respiration, which could not be relieved by all the efforts used". She sank at 6.30 that evening.

POST MORTEM EXAMINATION.—The lungs exhibited decided evidences of bronchitis and pneumonia. There was peritonitis, limited to the neighbourhood of the uterus, which organ was contracted and healthy. The conjugate axis, from sacrum to pubis, was $2\frac{1}{2}$ inches.

Vide pamphlet by Dr. Murphy, *On the Comparative Claims of Craniotomy and the Cæsarean Section in a Certain Class of Labours*.

The time allotted for the reading of papers will not permit me to detail the foregoing cases. I must, therefore, content myself by presenting you with a brief summary, and then submit for your consideration certain conclusions which I deem legitimately deducible from such data.

The Cæsarean section, then, was performed nine times on the living subject, and once on the dead body. Of the nine, five were cases of distortion, three of these being due to rickets, two to mollities ossium, while in the remaining four there existed malignant growths in the pelvis. Four had reached the full period of pregnancy; and five, periods varying from seven and a quarter to eight and a half months. In two cases, labour had not commenced; in five, it had lasted for periods varying from five hours to five days. In five cases, the membranes were entire; in four, ruptured—in one, twenty, in another, forty-one hours before the operation. The general conditions of the patients were, in two good, in three bad, in two very bad, in one most deplorable, and in one hopelessly bad. One recovered, and eight died at periods varying from eighteen hours to eighteen days. Of the eight dead, five died of exhaustion, one of shock, one of pyæmia, and one of rupture of the colon. Of the nine children, seven were extracted alive, two premature (seven and a quarter to seven and a half months) dying shortly after birth; two were dead before the operation. Thus, out of

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nine cases, one mother and five children were saved; in all, six lives. Of the five cases operated upon for extreme distortion of the pelvis, all the mothers died, and three of the children were saved, two being dead prior to the operation; in one, a foot, in the other, the breech presented.

In the three cases of craniotomy for extreme deformity of the pelvis in my own practice, and in two recorded by Dr. Murphy, of which brief abstracts are given, all the mothers died and all the children were sacrificed, except one, which was in a decomposed state. Thus it is evident that, by the Cæsarean section, three lives out of ten were saved; whereas by craniotomy, in a similar number and in parallel cases, not one life was rescued.

The question we have now to decide in this important inquiry is, not through how small a space a mutilated foetus at full term can be drawn, but what is the smallest space through which such a body can be extracted with safety to the mother and to the integrity of her soft parts. Experimentalists have endeavoured to set this matter at rest by having holes carved out on blocks of wood and metal, and dragging mutilated foetuses through them or through the distorted dry pelvis; but Dr. Radford truly remarks, "It is one thing to operate on an inanimate machine, however accurately formed, and another to operate in the pelvis of a living woman." We are therefore compelled, in order to form a just estimate of the difficulties and results in such cases, to fall back upon clinical facts, few of which are, however, recorded. Dr. Robert Lee, whose experience of craniotomy far exceeds that of any other practitioner, and of whose dexterity in this operation there can be no doubt, succeeded, after "a severe and tedious operation", in dragging a six and a half months' foetus, much mutilated, through a pelvis measuring an inch and three-quarters in the conjugate diameter of the brim, and two inches and three lines in the antero-posterior diameter of the outlet; but, in so doing, the uterus was ruptured, and the patient "was left in a very exhausted state, and died the following day." This distinguished accoucheur also succeeded in delivering my sixth case of Cæsarean section, during her first labour, of a foetus at full term (which was, I am informed, much decomposed), through a brim the conjugate diameter of which was an inch and three-quarters; but she was left in a deplorable state, with a large vesico-vaginal fistula. It has been asserted by Dr. Osborn that, in a case where the widest side of the pelvis was only an inch and three-quarters broad, and not more than two inches long (I quote from Dr. Burns), he successfully delivered a woman; and, in more recent times, it has been stated that delivery had been safely effected in a patient in whom the conjugate diameter of the brim did not measure more than an inch and a half. My only reply is, that I believe those making such statements are far more likely to be in error as to the exact dimensions of the pelvis, than to have succeeded in effecting delivery safely to the mother through so small a space; and nothing but the most irresistible proofs will ever convince me that such an obstetric feat has been and can be accomplished. I quite agree with Dr. Radford, that "the statistics of craniotomy are in a very unsatisfactory state"; in fact, I know of none exclusively referring to the results of that operation in cases of extreme distortion of the pelvis, such as you are now called upon to contemplate. It is, therefore, clear that we can derive no aid from them; and, if we turn to the recorded experience of various authors, we meet with the greatest discrepancies of opinion. The limit in dispute demanding the Cæsarean section appears to range between one and a half to two and a half inches. Thus, out of sixty-two cases recorded by M. Velpeau, in which this operation was necessitated by distortion of the brim, the measurements were as follows:—One inch in one case; an inch and a half in eight cases; an inch and a half to two inches in twenty-three cases; two to two and a half inches in twenty-five cases; two and a half to two and three-quarter inches in five cases.

Time will not permit, nor do I deem it of any importance that I should attempt to reconcile such conflicting opinions. It is, however, of the greatest moment that endeavours should be made to lay down certain rules which may serve to aid us in coming to a correct decision in the serious cases under discussion. While admitting that our practice must be determined rather by the individual peculiarities of each case, than by statistical data or any abstract rule, still I think I cannot do better than adduce the following illustrations as guides. Thus, if called to a patient who had reached the full period of utero-gestation, whose powers were good and pains strong, in whom the soft parts were healthy, and whose pelvis measured fully two inches and a quarter in the conjugate diameter of the brim, the other dimensions being normal, I should hope to succeed in effecting delivery safely by craniotomy and the crotchet. If, however, with such a pelvis, she had been enfeebled by disease or suffering, and more especially if the soft parts were inflamed or swollen, or the other dimensions of the pelvis lessened, I should much prefer the easier and more rapid extraction of the foetus by

the Cæsarean section. Nothing would ever again induce me to attempt the delivery of a patient, at the full period of pregnancy, by craniotomy, whose pelvis did not measure fully two inches in the conjugate diameter of the brim, except I had strong reasons to believe that the foetus was in a decomposed state or premature; and not even then, if her powers had been much taxed, or the soft parts inflamed or otherwise damaged. Having determined the necessity for the Cæsarean section, what course should be pursued to secure the best results? There can be no doubt that much of the ill success attending the Cæsarean section, especially in Great Britain, is due to the patient's state of health at the time of the operation, and the tardiness with which it is too frequently performed. It is, therefore, of paramount importance, that the patient's general condition should be strictly attended to, and all unnecessary delay be avoided. In confirmation of these statements, the statistics of M. Dufoillay may be adduced, who has collected all the cases in which this operation had been performed between the years 1845 and 1861. In those cases operated upon at an early period of labour, before the powers of life were broken down, 81 per cent. recovered; whereas, in those who were exhausted by protracted suffering, 19 per cent. or in Great Britain only 11 per cent., were rescued from the grave. I am disposed, however, to believe that these statistics are too good to be true. In all the cases which have come under my observation, either the dwarfed size of the patient, her past or present symptoms, or history of the previous labour or labours, ought to have, and in some cases did, suggest the existence of some abnormality demanding inquiry; and, where this most obvious course was adopted, the nature of the case was revealed, and every precaution taken. How often such inquiries are neglected, I might add, culpably, I have sad reason to know. The difficulty in determining the exact amount of distortion is sometimes very great. With a view to facilitate this important inquiry, I have much pleasure in submitting to your inspection a pelvimeter, easy of use. The chief point aimed at is to give accuracy to the finger. I have used it with the most satisfactory results in more than one case.

It is not my intention to enter into the details of the Cæsarean operation, which are so well known; still there are certain points which merit a passing comment. I have a strong conviction that greater success would attend our endeavours if all cases were operated upon at, or shortly after the completion of, the eighth month of utero-gestation, when the vessels are smaller, the contractile power of the uterus greater, and the liquor amnii relatively larger in proportion to the size of the child. By pursuing such a course, a smaller incision would be required, less blood would be lost, and the extraction of the foetus would be thereby greatly facilitated. In cases of rapidly developing malignant disease, especially if attended with large losses of blood, or where the affection is greatly undermining the patient's health and enfeebling the foetus, early interference would be imperatively demanded. The incision, usually from six to seven inches in length, should be made in the linea alba, and in a corresponding line from the fundus, through the body, and down to, not through, the neck of the uterus, and while that organ is in a state of active contraction. If the placenta be placed anteriorly; it should be detached sufficiently to enable the hand to pass into the uterus, by which the child should be rapidly extracted by grasping the feet or breech. Should the membranes be entire, they must be ruptured at this time. The child being removed, the whalebone needle with diaphragm (exhibited) should be passed through the internal os uteri into the vagina, so as freely to sweep out the cervical canal, and thus permit of a ready escape of the uterine secretions. The placenta may be removed either previously or subsequently to this last procedure, according to the amount of hæmorrhage. From the commencement of the operation to the removal of the placenta, occupied from one minute and a-half to two minutes in the cases recorded. The application of ligatures, with a view of keeping the edges of the uterine incision together, are worse than useless, owing to the alternate contractions and relaxations of the uterus. They are sure to tear out, as in case No. 8, and act as sources of irritation. As soon as the uterus thoroughly contracts, all blood and coagula should be removed from the cavity of the peritoneum, and the whole of the abdominal wound be brought together with ten or twelve interrupted silk sutures.

Although no anæsthetic was used in my first two cases, the patients complained of but little pain; in fact, when questioned, they described the operation as less painful than a strong labour pain. In the five following cases chloroform was administered with decidedly damaging effects; so much so, that I have resolved never again to use that agent in similar cases. The ether-spray was used, in my two last cases, with the best results, little or no pain being experienced; besides which, the uterus contracted so well under the cold produced, that there was no material loss of blood. In the ninth case I attribute my success to early interference, to the speedy administration of nutritious and stimulating diet, to the unwearied attention of my pupils—Messrs. Arnold and

Hemorrhage, and to the admirable manner in which the local anæsthetic was employed by Dr. Richardson. In conclusion, a word or two as to after treatment, which, upon broad principles, should depend on the general condition of the patient, and the nature and severity of the symptoms. It is worthy of remark, that although five out of the nine cases lived for periods varying from two to eighteen days, not one died from the effects of abdominal or uterine inflammation, but from causes more or less interfering with, or taxing, the vital powers. This I conceive to be a most important fact, and one worthy of serious consideration. In the majority of the cases a supporting and cautiously stimulating system was carried out from the first with good results; so much so, that I have strong reasons to believe, and those who watched some of the cases with me have expressed similar convictions, that had this plan been carefully and systematically followed out in all the cases recorded, I should have been enabled to place before you not one, but three, successful cases.

CASES ILLUSTRATIVE OF PROGNOSIS IN HEART-DISEASE.

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IN the BRITISH MEDICAL JOURNAL for 1866, there was published a paper of mine on Prognosis in Valvular Disease of the Heart; and it is my wish to illustrate some of the points therein advanced by a few cases in which the principles laid down have been applied. The Elements of Prognosis I gave as based upon the following considerations.

1. The organic condition of the heart as ascertained by physical signs.
2. The degree of impairment in its functional efficiency, as manifested by symptoms.
3. The general state of health and soundness of tissues and organs.
4. The presence or absence of conditions tending to aggravate the valvular or structural lesions in the heart, or to precipitate the occurrence of complications.

Each of these general considerations was subdivided into special indications.

1. The organic condition of the heart was shown to depend upon:
 - A. The particular valve affected, and the effect produced by the lesion, constriction, or insufficiency, causing obstruction on the one hand, regurgitation on the other.
 - B. The extent of the damage sustained by the valve, and the degree of mechanical difficulty in the transmission of the blood to which it had given rise.

The murmurs enable us easily to locate and characterise the valvular alteration; and the relative gravity of the different affections I gave, according to Dr. Walshe, as follows: Mitral regurgitation and constriction; aortic regurgitation; pulmonary constriction; aortic constriction; pointing out the special tendencies and dangers of each.

A considerable degree of change in any valve will cause derangement of the circulation, and out of this the danger arises. But the delay may be of two kinds: from an obstacle or impediment to the transit of the blood through the heart, causing it to accumulate in the veins—this I have called "obstruction"; or from deficient *vis a tergo* in the expulsion of the blood from the heart, which primarily causes sluggishness and feebleness of the onward current in the arteries—this I termed "stagnation". The two are always more or less combined in different degrees; but, speaking generally, the tendency of mitral disease is to obstruction of the circulation, and the danger congestion; the tendency of aortic disease is to stagnation, and the danger syncope.

The degree of change which has taken place in the valve is of far greater import than the particular valve affected, and is far more difficult to ascertain. The character of the murmur is no guide; the great indication is the amount of structural change in the walls and cavities of the heart—hypertrophy and dilatation—to which the mechanical difficulty has given rise, and, when cardiac symptoms are present, their nature and severity.

2. The degree of impairment in the functional efficiency of the heart, the result of its organic condition, and aiding in the estimation of this, is shown:
 - A. By the evidence of habitual derangement in the systemic and pulmonary circulation, such as shortness of breath on exertion, a congested condition of the capillaries, dusky face, blue lips, cold extremities, etc.
 - B. By the liability to paroxysms of dyspnoea or attacks of palpitation.
 - C. By the existence of secondary consequences—pulmonary complications or dropsy.

3. The general state of health and soundness includes:
 - A. The condition of the blood and tissues—the existence or not of anæmia and innutrition.
 - B. The soundness and functional activity of the important viscera, or the reverse.

4. The conditions tending to affect the state of the valves, or to precipitate or retard evil consequences, are:
 - A. The progressive or stationary character of the disease in the valves.
 - B. The structural health or degeneracy of the walls of the heart and coats of the great vessels, when this can be ascertained.
 - C. The mode of life of the patient.

There can be no case of heart-disease into the prognosis of which all the four great general considerations will not enter, and few in which most of the special indications will not find a place. It would, however, be impossible to illustrate each point by individual cases. Some are at once obvious. One of the points which I wish especially to enforce by the examples I have to bring forward, is the importance, as an element in prognosis, of the character of the pathological process by which the alteration in the valves has been brought about.

The importance of inquiring into the nature of the change in the valve consists in the fact that, according as it is due to one or other of the common affections to which the valves are liable, it will probably be stationary or progressive. If it be traceable to an attack of acute rheumatism, in the absence of further attacks, it may be expected to remain in its existing condition. If it be recognised as due to atheromatous change or other disease of progressive character, this will continue, and will increase the degree of impairment already induced. This consideration has, of course, most weight before serious symptoms have developed themselves. In the one case, they may be postponed indefinitely, unless precipitated by some powerful exciting cause; in the others, they will be evolved sooner or later from the increasing imperfection in the valvular apparatus. It has its value, also, when complications have set in. In the one case, we may have reason to believe that compensatory changes in the heart-walls have for some time balanced the changes in the valves, and that rest and favourable circumstances may restore equilibrium. In the other, we can never have this assurance.

Another point which I wish to illustrate is, that the changes in the walls of the heart, the hypertrophy and dilatation, are indicative of the degree of mechanical difficulty caused by the morbid changes in the valves, and that their prognostic indications are best estimated in this light. Recent authors of great eminence have enunciated the following views: 1. That the symptoms which appear in heart-disease, and the dangers attending it, arise not so much from the state of the valves as from co-existing hypertrophy or dilatation, which are said to increase, and not to counteract, the derangement in the circulation caused by the valvular disease. 2. That this hypertrophy and dilatation are not due to mechanical difficulty occasioned by the imperfect function of the valves, but to inflammation, congestion, innutrition, or other affection of the walls of the heart arising independently of the valvular change.

I hold, on the contrary, that the hypertrophy and dilatation are, as a rule, caused by the mechanical difficulty arising out of the change in the valves, and are, at the same time, the result and the measure of the difficulty. I hold, again, that hypertrophy and dilatation are, for the most part, alike conservative, and tend to counteract the effects of the valvular disease; and that the symptoms, instead of being due to the hypertrophy and dilatation, are due to the valvular obstruction or insufficiency, the effects of which they fail perfectly to neutralise.

According to the view first stated, in a case where a valvular murmur was found to co-exist with alterations in the walls and cavities of the heart, there would be valvular change of uncertain amount, complicated with hypertrophy and dilatation of uncertain origin, and the symptoms which might exist would be due in uncertain proportion to the one or the other. As I should look upon it, the degree of hypertrophy and dilatation would indicate the extent of the valvular disease—being caused by the mechanical difficulty to which this gives rise, and tending to overcome it. In the absence of symptoms, the compensation is effected, and the structural change would furnish an exact measure of the valvular change. Any symptoms which may arise are due primarily to the imperfect function of the valves; and their comparative severity marks the degree in which the hypertrophy and dilatation have failed to overcome the obstruction.

Hypertrophy and dilatation are looked upon as furnishing unfavourable prognostic indications under both views, but for different reasons—on the one hand, as in themselves an evil superimposed upon the lesion of the valve; on the other hand, as marking the great extent of this lesion.

We may be called upon to give an opinion as to the future of a case in which a valvular murmur exists under various circumstances. 1. When the subject of the murmur is apparently in perfect health; as, for instance, when examining for life assurance. 2. When suffering from cardiac symptoms of various kinds and in different degrees, not immediately threatening life. 3. When in some stage of dropsy, or in the crisis of some pulmonary complication.

My illustrations are drawn chiefly from the out-patient practice of St. Mary's Hospital; and the cases, in consequence, belong chiefly to the