twelfth nerves, as also of the area acoustica—explaining the deafness—seemed to point to a nuclear lesion as being the more probable explanation.

Mr. JOHN F. O'MALLEY (London) thought that it was becoming clear that the causes of vocal cord immobility or partial immobility were predominantly neurological. In many cases they could be elucidated, yet there was a large residue for which no explanation could be found. It was obvious that traumatism, disease, aortic aneurysm, and poisons (either metallic or pathological) might be concerned. Reasoning by analogy, peripheral neuritis due to exposure to cold was quite conceivable as a cause, as in Bell's palsy of the face. After tracing the cause, as it was possible to do in a vast number of cases of vocal cord paralysis, the gravity of the latter symptom could be apportioned; where no such grave cause could be found the prognosis would be favourable.

Dr. BROWN KELLY, in his reply, considered that in a case of immobility of the vocal cord, when every means had failed to reveal the cause, the possibility should be kept in view of one of the following conditions being present: (1) a sclerosed lymphatic gland which could exercise pressure on the recurrent nerve throughout life and give rise to no other signs; (2) central nervous disease, of which for years the vocal cord paralysis might be the sole manifestation; (3) neuritis due to such causes as alcohol; and (4) myopathic disturbances following influenza and other infections. The term "fretting" of the recurrent laryngeal seemed to describe suitably the irritation to which this nerve was exposed when, as had been recorded, a temporary increase in blood pressure, presumably accompanied by increased distension of the aorta, gave rise to a transient paresis, or when it was roughened by calcareous plates in the concavity of the arch. Dr. Birkett's description of laryngeal paralysis produced by cold winds was of interest, and added another to the category of possible causes.

Mr. TILLEY, in reply, emphasized the early appearance of the local lesion, swelling of the arytenoid, as proving the case to be articular and not neurological in origin. With regard to fretting by the aorta, in transient cases he advocated a more thorough examination of the chest by the surgeon, and deprecated the too hurried transference of cases to others before any further attempt at investigation was made.

THE FAILED FORCEPS CASE AND ITS TREATMENT.*

BY

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Of the many types of grave obstetric emergency with which any large maternity service has to deal there is none which so taxes the judgement and skill of the attendant or occasions more anxiety in the days which follow delivery than that which comes under the category of the "failed forceps" case. On reviewing a series of five hundred emergency admissions to the Edinburgh Royal Maternity Hospital, it was found that in eighty-eight, or 17.6 per cent., forceps had been applied and efforts made at extraction without the desired result.

An analysis of these cases shows that the commonest individual cause of failure was disproportion, due either to abnormal size of the child or to contracted pelvis, the latter being found in varying degrees in about 40 per cent. of cases. The pelvis were for the most part of the generally contracted and flat rachitic types, although in seven out of a total of thirty-four cases in this group an outlet deformity was responsible for difficulty. I would especially direct attention to the treacherous nature of this last type of pelvic abnormality—treacherous in that, as in five of these seven cases, the measurements of the pelvic inlet may be normal, the head may engage in the brim in a normal

manner, and a good prognosis as regards spontaneous birth may be formed; only when the head is arrested at a low level in the pelvis is the abnormality recognized; as a rule the opportunity for Caesarean section has passed, and craniotomy, or at best a difficult forceps delivery, is inevitable. Serious outlet contraction is, of course, not commonly encountered in general obstetric practice, but the high proportion of cases of this type (seven in thirty-four) in the present series indicates how readily the deformity may escape notice.

A posterior position of the occiput was found to be an almost equally common cause of difficulty. In the majority of cases the malposition had not been recognized, and there has commonly been a history of forceps having been applied several times without success. Many of these patients showed severe laceration of the soft parts, probably from slipping of the forceps, and in one case rupture of the lower uterine segment had occurred. On admission to hospital the position of the occiput varied; in some the head was still in the oblique diameter of the pelvic cavity, in others posterior rotation to the hollow of the sacrum had occurred, while in several forward rotation was in progress. In a few cases the head was still riding free above the pelvic brim.

A third group comprises cases in which no abnormality of the pelvis was present, the child was of average size, presentation and position were normal. It is possible that some of these were patients in whom an occipito-posterior position had been present when forceps delivery was first attempted, rotation of the occiput to the front having occurred during the patient's transit to hospital. In a large number of cases in this group, however, no obvious explanation of failure could be found, and it was difficult to avoid the conclusion that anxiety to relieve suffering had prompted an attempt to assist delivery before complete dilatation of the passages and adequate moulding of the head had been allowed to take place. As in many instances of contracted pelvis and the occipito-posterior position above referred to, intervention was unsuccessful largely because it was premature and necessarily entailed, not infrequently, serious injury to cervix and vagina. Finally, in a small group in which forceps delivery was unsuccessfully attempted, there fall to be catalogued two face cases, one of them a mento-posterior, one brow presentation, and one case of ovarian tumour obstructing labour.

TREATMENT.

Hyperbole might be exhausted in emphasizing the value of prophylaxis. It is, however, sufficient testimony to the value of ante-natal supervision to record that, whereas approximately one-third of the cases in this analysis were seen by a doctor for the first time after the commencement of labour, there were, on the other hand, only three failed forceps cases, so far as information is available, among more than 6,000 patients who, during the period under review, attended the hospital ante-natal clinic.

Where moderate forceps traction fails to effect delivery, further treatment will naturally be governed by conditions present in the individual case, and in particular by the information which the following lines of investigation afford: (1) What is the nature of the obstruction? (2) Is birth of a living child *per vias naturales* possible? (3) If delivery by the natural passages is contemplated, is immediate intervention in the interests of mother or child desirable or not? (4) If delivery of a living child *per vaginam* is impossible do the conditions present warrant or forbid Caesarean section?

The Nature of the Obstruction.

The commoner causes of the obstruction have already been detailed. Careful abdominal examination, accurate measurement of the bony pelvis including the pelvic outlet, and vaginal examination, preferably under anaesthesia, with the whole or half-hand, will usually yield the information required. Diagnosis of the occipito-posterior position in particular is often difficult, especially in those instances in which a large caput succedaneum has obscured the usual landmarks. By the introduction of the hand the position of the head can be determined without doubt, and the existence and degree of pelvic deformity

* Read in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Edinburgh, 1927.

ascertained. The following test may occasionally be of value in the diagnosis of an occipito-posterior position. If the fore and middle fingers are placed one on either side of the frontal suture the frontal bones may be alternately depressed one on another. As the result of moulding, the occipital and frontal bones are overlapped by the parietals, and one parietal overrides its fellow, so that at the frontal suture alone can this mobility be elicited. The advancing sinciput can thus be readily recognized.

Is Birth of a Living Child by the Natural Passages Possible or Not?

If the child is dead, or from repeated ineffectual attempts at delivery and obvious signs of foetal distress survival seems improbable, the immediate problem is simplified, perforation being as a rule indicated. Whether or not this should be followed by immediate extraction will depend on the condition of the patient and the degree of dilatation of the soft passages.

If the child is still in reasonably good condition, the possibility or otherwise of vaginal delivery must next be determined. Where dystocia is due to abnormal presentation or position alone, correction of the abnormality is as a rule followed by a rapid and easy termination of labour.

Where, on the other hand, there is disproportion, due either to pelvic contraction or to abnormal size of the child, the following points must be taken into consideration in assessing the possibility of vaginal delivery. (1) Pelvic measurements. (2) The relative sizes of head and pelvis and the degree of engagement as estimated by the Müller-Munro Kerr method—a manoeuvre most satisfactorily carried out under anaesthesia with the aid of an assistant. (3) The patient's previous obstetrical history, if she is a multipara. (4) Whether or not the patient has had a real test of labour. It is obvious that where in addition to pelvic deformity labour is complicated by malposition or malpresentation, such as anterior parietal advance in a flat pelvis, the prospects of successful vaginal delivery may be seriously compromised.

Is Immediate Intervention Advisable or Not?

Where delivery of a living child by the natural passages is considered feasible the important question arises as to whether immediate intervention is desirable or not. In an earlier paragraph it has already been indicated that a premature attempt to effect delivery may not only defeat its own end, but also inflict serious injury on the maternal soft tissues. The ability of Nature to deal successfully with considerable disproportion, if given time, has been repeatedly demonstrated by cases of different types in this series, which were ultimately delivered spontaneously or by an easy low forceps operation, while intervention some hours earlier had completely failed. Moreover, while signs of maternal or foetal distress or arrest from such conditions as face or brow or occipito-posterior position may at any time demand active intervention, the results, both to mother and child, have unquestionably been best in cases in which it has been possible to delay intervention until full dilatation of the passages and the maximum degree of head-moulding have been allowed to occur.

Caesarean Section versus Craniotomy.

Where obstruction is such as to preclude the possibility of successful vaginal delivery there arises the controversial question as to whether, in the presence of probable infection, Caesarean section or craniotomy is the correct line of treatment. Farquhar Murray has recently drawn attention to the difficulty and danger which craniotomy entails in the presence of serious disproportion, and has strongly urged more frequent resort to Caesarean section in such cases, even where there is undoubted infection and the child is dead. On the other hand, the statistics of Holland and Kerr and of Routh indicate clearly how much more grave is the prognosis where Caesarean section is done in the potentially septic than in the "clean" case, the mortality in the former varying from 10 to 34 per cent. Moreover, Schauta's analysis of 5,000 cases of contracted pelvis shows a maternal mortality of approximately only 4 per cent. in 158 cases delivered by craniotomy. The Edinburgh Royal

Maternity Hospital figures over a number of years show a rather lower Caesarean section mortality and a distinctly higher mortality percentage in cases delivered by craniotomy.

While statistical evidence is fallacious, the figures referred to are in accord with the general body of obstetric opinion that where gross infection is suspected as the result of repeated handling, a rising temperature, offensive liquor amnii or the development during labour of a purulent discharge, craniotomy entails less risk than Caesarean section.

In no class of case is it less possible to lay down any rule-of-thumb method of treatment. All that I would suggest is that where the child is dead or dying, and disproportion not pronounced, or where major surgical facilities are not readily accessible, craniotomy is the wiser procedure; where, on the other hand, the child is alive, the degree of infection slight and disproportion considerable, Caesarean section is warranted. In borderland cases between these two extremes the choice of procedure must depend on the varying conditions present in the individual case and on the personal experience and judgement of the operator.

The Place of Internal Version.

Twenty-five years ago obstetric literature was much occupied with discussions regarding the relative merits and demerits of forceps and version as competitive procedures in labour complicated by contracted pelvis. Partly as the result of ante-natal recognition of disproportion, and partly because of the increased safety of Caesarean section, that type of case in which internal version might be considered the treatment of choice is encountered less frequently than formerly. In Edinburgh, at least, the recognized dangers to the child of a head-last labour have resulted in a tendency to restrict version to a small selected group of cases. If such operative procedures as Caesarean section and pubiotomy are inadvisable or not feasible, and the head is riding free above the brim of a moderately contracted flat pelvis, there are three options of treatment—high forceps, internal version, and craniotomy. The high forceps operation almost necessarily entails a faulty and insecure application, large diameters are brought to bear across the pelvic brim, and delivery, if possible at all, can be effected only by the exertion of great force, the usual result being a dead child and a badly traumatized birth canal. There remain version and craniotomy, and where the above conditions obtain, version may occasionally succeed in saving the child, where the operation is not forbidden by severe infection, too great disproportion, or a dangerously thinned-out lower uterine segment. I would not put the case for internal version more strongly than that; in the last twenty-six cases of this type in which internal version has been done in the Edinburgh Royal Maternity Hospital all but five of the children were stillborn.

END-RESULTS.

In conclusion, I would refer briefly to the tragic end-results of many of the cases in the present review. Seventeen of the eighty-eight patients died—a mortality of 19 per cent., and one which is scarcely exceeded by that associated with any of the major complications of pregnancy or labour. The individual causes of death were: sepsis 12, rupture of the uterus 2, post-partum haemorrhage and shock 2, and eclampsia 1. In addition, in thirty-nine (44.3 per cent.) the puerperium was morbid according to the British Medical Association standard, many of the patients recovering sufficiently to leave hospital only after exhausting weeks of fever. Few patients escaped without more or less serious laceration of cervix, vagina, or pelvic floor. Sloughing of the vaginal tissues with fistula formation occurred in three cases. Further, it will be appreciated that primary suture was seldom feasible or successful. Many patients were perforce discharged only to face many weeks or months of further ill health, and in a few the future was one of permanent invalidism. Including stillbirths and neo-natal deaths, forty-six of the infants were lost—a mortality of 52 per cent.

CONCLUSIONS.

The conclusions suggested by this clinical analysis may be summarized as follows:

1. The overwhelming evidence in favour of careful antenatal examination, particularly in primigravidae and in multiparous women with an unsatisfactory previous obstetric history.

2. The importance of careful routine measurement of the pelvic outlet, which may be contracted in spite of a normal superior strait, and is thus a deformity specially liable to be overlooked.

3. The grave danger entailed by non-observance of elementary rules with regard to the application of forceps through an incompletely dilated cervix or in the presence of marked disparity in the relative sizes of head and pelvis.

4. The necessity when moderate forceps traction fails of recognizing the nature and degree of obstruction and of determining whether vaginal delivery of a living child is possible or not.

5. The remarkable capacity on the part of Nature, if given time, to overcome considerable disproportion by moulding of the head, and the realization that the condition of mother or child, rather than the actual number of hours passed in labour, should constitute the indication for assisting delivery.

DISCUSSION.

Dr. BETHEL SOLOMONS (Dublin) did not quite understand what treatment had been given to those patients who had died. He personally had a very decided preference for pubiotomy or lower segment Caesarean section to craniotomy on a living child.

Mr. R. H. PARAMORE (Rugby) referred to his experience in cases of pubiotomy.

Professor FLETCHER SHAW (Manchester) regretted that this very important paper had been crowded into the end of a long morning's work. It was most unfortunate that time could not be given to its discussion, and he urged that this subject should be fully dealt with at the meeting next year at Cardiff.

Professor McILROY supported Professor Shaw's proposal, and the PRESIDENT (Dr. Haig Ferguson) agreed that the suggestion should be made in the right quarter.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

FORMALIN POISONING: RECOVERY.

As poisoning by formalin is a rare accident, according to the textbooks of toxicology, the following details of a case of poisoning may be of general interest.

On September 5th I was called to see a boy, aged 7, who was showing symptoms of poisoning after drinking some disinfectant. Arriving at the house about fifteen minutes after the poison had been swallowed, I found that the patient had entered a room which was being disinfected by a workman by orders of the local sanitary authority; seeing a bottle on the floor containing a liquid which he took to be lemonade, he drank the remainder of the contents of the bottle, amounting to possibly half an ounce of the liquid.

I found the boy somewhat collapsed, though quite sensible; he complained of a burning pain in his throat and epigastrium. His pulse was rapid and weak; he had vomited once, bringing up a quantity of clear, greenish fluid, and he was gasping for breath. The nature of the disinfectant was unknown to the workman, who had gone away to inquire as to its composition. I smelt the vomited matter and at once detected that pungent odour so familiar to those who have frequented a dissecting room; I decided that the poison must be formalin. This conclusion was subsequently confirmed by the workman on his return, the disinfectant being commercial formalin, a 40 per cent. solution of formaldehyde in water.

The treatment I adopted was washing out the patient's stomach through the siphon tube; I then introduced a quantity of very dilute solution of ammonia, which was left in the stomach. The latter procedure was an attempt to produce the well known reaction by which ammonia and formaldehyde unite to produce the condensation product hexamethylene-tetramine, more familiarly known as urotropine or hexamine, a harmless compound. I also caused the patient to be put to bed with hot bottles and gave instructions for the administration of demulcents. The child

now appeared fairly comfortable. On the following day the patient was in his usual health except that he complained of slight pain in the throat on swallowing; he has since made an uneventful recovery.

From a study of the literature available, it appears that one ounce of commercial formalin has proved fatal for an adult. From what I was told the quantity swallowed by the boy would probably have been a fatal dose for a child of the patient's age.

Kettering.

G. H. MARCH, M.B., Ch.B. (Vict.).

A CASE OF SIMPLE CLEFT STERNUM.

CLEFT sternum is a sufficiently rare condition to justify a record of the following example.

The subject was a healthy girl, aged 11, with an uneventful medical history. Though the deformity was noticed at birth, particular attention was not drawn to it until the girl was examined at a school clinic, and doubt was then expressed as to whether she was fit to play games owing to the risk of a blow on the chest.

In the anterior wall of the thorax there is a marked depression due to complete absence of the presternum. The ends of the clavicles are separated by a gap of about two inches during expiration, which increases to two and a half inches on inspiration. The cleft extends down as far as the fifth costal cartilage, the ends of the upper four costal cartilages on each side being connected by a fibrous or cartilaginous strip. The cleft narrows as it approaches the fifth costal cartilage, where the two halves of the metasternum become joined by a band of strong fibrous tissue—from the fifth to the seventh costal cartilage. A xiphisternum could not be felt.

There is a slightly asymmetrical appearance of the chest, but measurement does not confirm this, both sides being equal and no kyphosis or scoliosis being present. In the depression formed by the absence of the sternum the pulsation of the aorta is very marked. The heart is normal in size and position and no cardiac murmurs are audible.

During coughing or forcible expiration the anterior edges of each lung herniate through the cleft; this produces an alarming swelling on the front of the chest. This condition gives rise to no discomfort to the child except if pressure is applied, such as would be present if the sternum were complete.

D. M. Greig¹ has collected from the literature twenty cases of simple cleft sternum. Six of these cases had concomitant anomalies. In the case here described no other abnormalities could be detected, apart from an unusual amount of extension at the elbow.

I am indebted to Mr. E. Cyril Dobie, senior honorary surgeon to the Chester Royal Infirmary, for permission to publish this case.

W. GRIFFITH LOVE,

M.B., Ch.B. Ed.,

Late Senior House-Surgeon, Chester Royal Infirmary.

ACUTE PULMONARY OEDEMA: RECOVERY.

DURING the last few months several cases of acute pulmonary oedema have been reported, and therefore the following details of an instance of recovery following an attack seem worthy of record.

A man, aged 60, was seen at the end of June, 1927, on account of an attack of follicular tonsillitis which responded rapidly to treatment. He did not feel ill "in himself," and remained at work. During the night of July 12th I was called to see him. He was sitting in a chair very cyanosed, breathing rapidly and with great difficulty, and expectorating large quantities of blood-stained froth. His chest was full of moist râles and the heart sounds were very weak. His pulse was 140 and thready. The attack had come on about a quarter of an hour previously, following sudden diarrhoea. He was given 1/100 grain of atropine sulphate and 1/60 grain of strychnine hypodermically at once, and propped up in bed with hot-water bottles to his feet. He improved and was then given hypodermic injections of 1/12 grain of heroin and 1/100 grain of atropine sulphate. In about half an hour his breathing became more comfortable and the frothy expectoration almost ceased; he slept at intervals for the next twelve hours. He was kept under morphine for forty-eight hours, and by that time his chest was quite clear of râles and his pulse rate had fallen to 80.

The attack in this case was probably brought on by distension of the stomach following a heavy meal just before bedtime. The patient's cardio-vascular system and urine showed nothing abnormal. He was quite fit three weeks after the attack and has kept well ever since.

Winchester.

C. B. S. FULLER, M.D., M.R.C.P.

¹ *Edinburgh Medical Journal*, August, 1926.