incomplete division of the circular muscle fibres. In no case, so far as we have been able to ascertain, has the tumour been shown to have persisted for more than a few weeks after this type of operation. Two patients at St. James' Hospital who had Ramstedt's operation in infancy have undergone laparotomy in adult life, one for gastric ulcer and the other for recurrent appendicitis. In both the pylorus felt normal and there appeared to be no persistence of the hypertrophy.

If the infant is treated by gastro-jejunostomy the tumour frequently remains unaltered (Holt, 1917), even well into adult life (Donovan, 1946; Walters, 1946; Armitage and Rhind, 1951; and others). Indeed, the cases recorded suggest that the tumour nearly always does persist after gastro-jejunostomy, though this may be an erroneous impression, as the absence of a tumour at a subsequent operation may be overlooked or not regarded as worthy of record. Be this as it may, it is difficult to imagine why a short-circuiting operation will lead to persistence of the tumour while other forms of treatment will cause its disappearance. We agree with McCann and Dean (1950) that the tumour will persist in a proportion of medically treated or subclinical cases and will be discovered only at necropsy, at operation for some other condition, or when some additional mechanical or inflammatory factor leads to increased stenosis with the production of symptoms.

The frequent finding of a peptic ulcer in association with the condition indicates that there may be some relationship between the two. It has been postulated that stasis is conducive to peptic ulceration: several papers have drawn attention to the incidence of duodenal ulceration in duodenal ileus, and recently Johnson (1955) has suggested that gastric ulceration may follow pyloric stenosis. The hypertrophy, then, may explain the gastric ulcers, but would not account for the duodenal ulcers.

Kirklin and Harris (1933), reviewing the literature and describing 81 cases seen at the Mayo Clinic, list the following radiographic appearances which may be aids to diagnosis: (1) lengthening of the pyloric canal (normal does not exceed 1 cm.); (2) a narrowing of the pyloric canal, though this is variable; (3) a narrow crevice or a longer depression about the mid-point of the lower edge of the canal; and (4) concavity in the base of the duodenal bulb—that is, a duodenal bulbar impression. They considered that the only definite pathognomonic feature was the last of these. While it is of interest, and occasionally of importance, to make a pre-operative diagnosis, we would emphasize that all filling defects in the region of the pyloric canal in adults should be regarded as neoplastic until proved at operation to be benign.

It has been stated (Morley, 1949) that it is difficult to distinguish this condition from a carcinoma of the pylorus, but we have found that, when it has been met with once and diagnosed at operation, recognition of the innocent nature of the tumour is relatively easy. If in doubt, a small incision with diathermy into the tumour will render the diagnosis more obvious, as the glistening, bulging cut surface of the muscle is quite characteristic and in no way resembles the cut surface of an infiltrative type of neoplasm.

Having identified the lesion, we have dealt with it along the following lines: (1) If a peptic ulcer is present a gastrectomy is performed. The presence of hypertrophy is no contraindication to the Billroth-I type of reconstruction, as the duodenum is never involved in the hypertrophy. (2) If there is no obvious ulcer on examination of the serosal surfaces of stomach and duodenum and after careful palpation, we consider the history, and where there is a good clinical history suggestive of peptic ulcer we perform a Billroth-I gastrectomy, since on occasions ulcers have been found only after examination of the resected specimen. (3) If the clinical history is atypical and the diagnosis has been mainly based on radiological findings, we advise a pyloro-duodenotomy, biopsy, and resuture transversely to make a Heineke-Mikulicz pyloroplasty. This is most likely to prove satisfactory where there is coexistent mucosal stenosis (Tanner, 1950).

It is very inviting where no other lesion is found to perform a Ramstedt operation, and this was done in Case 16. The result so far has been most gratifying, but as the patient had no gastric symptoms before laparotomy for intestinal obstruction it is hardly a fair test.

In conclusion we would like to add that since we started to make a particular study of this condition in 1953 we have identified it with greater frequency than we had done before, and are sure that it is a far more common condition than is generally realized.

Summary

In the past ten years 25 cases of pyloric hypertrophy in adults have been seen during laparotomy at St. James' Hospital. In no case was a confident diagnosis of the condition made before operation, though in three cases the radiologist had suggested this possibility. All but two cases presented with symptoms suggesting peptic ulceration, and a peptic ulcer was in fact found in 18.

The radiological findings are reviewed and the aetiology is discussed. Where an ulcer is found or there is a history suggesting peptic ulcer a Billroth-I partial gastrectomy is advocated as the best form of treatment. In other cases, after exclusion of gastric carcinoma by biopsy, a lesser operation may suffice.

We acknowledge with thanks the kind co-operation of Mr. Norman Tanner in allowing us to use his cases. Our thanks are also due to Dr. R. V. Quilliam for his helpful suggestion with the radiographs.

REFERENCES

- Armitage, G., and Rhind, J. A. (1951). *Brit. J. Surg.*, **39**, 39.
Donovan, E. J. (1946). *Ann. Surg.*, **124**, 708.
Holt, L. E. (1917). *J. Amer. med. Ass.*, **68**, 1517.
Horwitz, A., Alvarez, W. C., and Ascanio, H. (1929). *Ann. Surg.*, **89**, 521.
Johnson, H. D. (1955). *Lancet*, **1**, 266.
Kirklin, B. R., and Harris, M. T. (1933). *Amer. J. Roentgenol.*, **29**, 437.
McCann, J. C., and Dean, M. A. (1950). *Surg. Gynec. Obstet.*, **90**, 535.
Morley, J. (1949). *Proc. roy. Soc. Med.*, **42**, 659.
Runström, G. (1939). *Acta paediat. (Uppsala)*, **26**, 383.
Tanner, N. C. (1950). *Medical Annual*, p. 312. Wright, Bristol.
Walters, W. (1946). *J. Amer. med. Ass.*, **131**, 1269.
Wollstein, M. (1922). *Amer. J. Dis. Child.*, **23**, 511.

LOCAL ANALGESIA AND KIELLAND'S FORCEPS

BY

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[WITH SPECIAL PLATE]

The dangers of general anaesthesia in operative obstetrics have been repeatedly emphasized in recent years (Jeffcoate, 1953; Parker, 1954, 1956). Forceps delivery is by far the commonest operation performed, and is probably the most dangerous from an anaesthetic point of view. To avoid this risk some have advocated a return to operating with the patient in the lateral position, while others have advised the use of local analgesia wherever possible. Up to the present it has, however, been the general experience and opinion (Parker, 1956) that pudendal block and local infiltration of the perineum is applicable only to about 60% of all forceps deliveries—that is, those in which the head is at the outlet and favourably rotated.

This paper describes the methods and presents the results of an attempt to extend beyond this limit the use

of local analgesia for forceps delivery. The work was carried out at Mill Road Maternity Hospital, Liverpool, during the 12 months April 1, 1955, to March 31, 1956. Lignocaine (1%) up to a maximum of 50 ml. was the agent used, by a technique similar to that described by Gate and Dutton (1955).

Over-all Results

During the year in question 3,553 babies were born in the hospital, and 410 of these (11.5%) were delivered by forceps. Of these operations, 94% were successfully conducted under local analgesia. The operations consisted of 266 outlet forceps without rotation of the head and 144 cavity forceps with rotation of the head. The proportion of primigravidae to multigravidae in the forceps series was 7:1, whereas for all deliveries it was 10:13. The mortality was as follows:

Maternal.—One mother died, but death was in no way related to the operation. She had extensive bronchiectasis and contracted pneumonia shortly before the onset of labour. The foetus died from asphyxia early in the first stage, and an easy low forceps delivery was performed under local analgesia when the head reached the perineum. The patient died 36 hours later from cardiac failure secondary to the lung condition. (Table I, Case 7.)

Foetal.—Table I shows the foetal loss with forceps delivery. Nine babies were stillborn, and two died in the neonatal period from gross malformations. Of the still-

TABLE I.—*Foetal Loss Associated with Forceps Delivery*

Case No.	Indications for Use of Forceps	Necropsy Findings	Remarks
OUTLET FORCEPS (264 cases under local analgesia)			
1	Foetal distress	Fresh stillbirth; asphyxia	Severe foetal distress before operation
2	Delay "	Macerated stillbirth	Admitted to hospital with foetal death <i>in utero</i>
3	" "	" "	" "
4	" "	Fresh stillbirth; asphyxia	Foetal death in first stage; cause unknown
5	" "	" "	Foetal death early in first stage; post-mature
6	" "	" "	" "
7	Maternal chest condition	" "	Maternal death (see above). Baby died at start of labour
CAVITY ARRESTS: KIELLAND'S FORCEPS ROTATION AND DELIVERY (125 cases under local analgesia)			
8	Delay with dead foetus	Macerated stillbirth	" "
9	Cardiac disease	Neonatal death: oesophageal atresia	" "
FORCEPS UNDER GENERAL ANAESTHESIA (21 cases)			
10	Delay	Neonatal death: bilateral hydro-nephrosis	" "
11	Eclampsia	Fresh stillbirth; asphyxia	"Flying squad" case; baby dead on admission

born babies, 4 (Cases 3, 4, 8, and 11) died *in utero* before the onset of labour and 3 (Cases 5, 6, and 7) during the first stage of labour. If the grossly malformed babies and those which died *in utero* before operation are excluded there were two stillbirths, a mortality of 0.5%. In both these cases an easy low forceps operation was carried out because of foetal distress, and necropsy showed asphyxial changes only. There were no foetal deaths from intracranial injury. That these results were not obtained by an over-ready resort to caesarean section in cases of potential difficulty is shown by the caesarean section rate of only 2.8%, despite the fact that the hospital serves a poor-class area where contracted pelvis, even rachitic in origin, is still prevalent.

Rotation of the Foetal Head

The need to rotate the foetal head is generally regarded as the largest single factor calling for general anaesthesia. Local analgesia is said to be unsuitable for these cases

because: (a) it does not permit the introduction of the whole hand into the vagina and the slight disimpaction of the head usually necessary for manual rotation; (b) it does not allow free abdominal manipulation of the trunk; and (c) it does not produce the uterine relaxation thought to be necessary to allow rotation of the foetal trunk with the head (Kerr and Moir, 1949).

In planning our work it seemed that the use of Kielland's forceps for head rotation offered a possible answer to the first difficulty. The second and third arguments appeared to be based on a belief that general anaesthesia is needed to produce sufficient uterine relaxation for trunk rotation, this having been handed down through generations of textbooks without its truth ever being seriously questioned. It was decided to investigate this by studying the behaviour of the foetal trunk radiologically during the course of rotation of the head by means of Kielland's forceps under local analgesia, 14 cases, in all of which a persistent posterior or transverse position of the head called for operative intervention, being so examined. In each case rotation of the head was easily achieved and was accompanied by rotation of the trunk without any abdominal manipulation whatever, and before traction was applied. (Special Plate, Figs. 1 and 2.)

This finding was clearly of importance. It led to the abandonment of manual rotation in favour of the routine use of Kielland's forceps for head rotation, and an immediate extension of the scope of local analgesia.

Kielland's Forceps

The techniques for the use of Kielland's forceps have been fully described by Parry Jones (1952) and Donald (1955), but certain points in their use under local analgesia deserve comment.

The successful application of the blades of the forceps under local analgesia demands extreme gentleness and the most careful attention to details of technique. For applying the anterior blade in cases of transverse arrest the classical method seemed unsuited for use without general anaesthesia; thus either the wandering or the direct method was employed, depending on the operator's preference.

Parry Jones has stated that the use of the direct method is limited to those cases in which the head is arrested at a low level in the pelvis, but we have found that by careful attention to the patient's position it can be employed in nearly all cases of transverse arrest at ischial-spine level. To do this the patient is placed in the lithotomy position on an operating table for direct application of anterior blade of Kielland's forceps. If position is achieved by lowering a folding leaf at foot of table this should be removed, to allow depression of handle of blade beyond the vertical.

FIG. A.—Patient in lithotomy position on operating table for direct application of anterior blade of Kielland's forceps. If position is achieved by lowering a folding leaf at foot of table this should be removed, to allow depression of handle of blade beyond the vertical.

sacrum resting on the edge and her buttocks overhanging slightly (Fig. A). Providing her buttocks are well clear of the end of the table, the handle of the forceps can be depressed *beyond* the vertical, and this allows the direct introduction of the anterior blade between the palmar surface of two fingers inserted anteriorly and the foetal head (Special Plate, Fig. 3).

It is next necessary to emphasize that for success with local analgesia it is essential that all manipulations be performed *between* contractions. This applies to application of the blades, rotation of the head, and also traction. This is contrary to the general recommendation that traction should be restricted to the period of uterine contraction, but it is necessary because, since the analgesia does not relieve the contraction pain, the patient is bound to be disturbed and may become uncooperative. By applying traction only between pains it is possible, in a large proportion of cases, to deliver the child without the mother realizing it has been born.

Among the 144 cases in which Kielland's forceps were used for rotation there was no case of urinary fistula, third-degree tear, or other maternal injury (Table II). This can

TABLE II.—*Morbidity with Forceps Operation (Including Four "Trial of Forceps" Cases which Came to Caesarean Section)*

Morbidity	Local Analgesia		General Anaesthesia	
	Forceps (Simpson's or Wrigley's) without Rotation (264 Cases)	Kielland's Forceps (125 Cases)	Trial of Forceps (11 Cases)	Other G.A. (14 Cases)
A. Maternal:				
Notifiable pyrexia ..	16	8	1	2
Post-partum haemorrhage ..	7	3	2	2
Secondary post-partum haemorrhage ..	3	Nil	Nil	Nil
Transient haematuria ..	2	2	"	"
Third-degree tear ..	2	Nil	"	"
Perineal breakdown ..	3	1	"	"
B. Foetal:				
Cephalhaematoma ..	2	1	"	"
Cerebral irritation ..	2	Nil	"	1
Facial paresis (all transient) ..	2	2	"	Nil
Fractured clavicle ..	1	Nil	1	"

be attributed to the conduct of the majority of the operations (125) under local analgesia, with resultant gentleness and delicacy in the handling of the instrument. There was no attributable foetal loss in the group, and this aspect is discussed later. The effectiveness of local analgesia for the Kielland's operation is shown in Table III. There was only one case in which local analgesia had to be abandoned in favour of general anaesthesia. Inhalation analgesia ("trilene" or gas-and-air) was administered only if the patient complained of discomfort.

TABLE III.—*Effectiveness of Local Analgesia for Kielland's Rotation and Delivery*

Very effective; patient undisturbed	No. of Cases
Satisfactory except for slight discomfort at some stage for which gas-and-air or trilene was given	105 (83%)
Unsatisfactory or impossible to inject	20 (16%)
	1 (1%)

While it is realized that the assessment of comfort is individual and open to question, we are convinced that none of the patients experienced any distress comparable to that associated with the passage of a stomach tube in the second stage of labour, which is usually regarded as an essential preliminary to any general anaesthetic in the circumstances.

Supplementary Sedation

Cases where the patient is apprehensive and uncooperative or where discomfort is experienced during injection of the analgesic present a special problem. In the earlier part of the investigation general anaesthesia had to be resorted to for two simple low forceps deliveries on this account, and following this we tested the effect of an intravenous injection of a mixture of pethidine hydrochloride, 100 mg., and chlorpromazine ("largactil"), 12.5 mg., diluted with 10 ml. of normal saline solution. The purpose of the small quantity of chlorpromazine is to counteract the emetic effect which the rapid injection of pethidine usually produces, but it also potentiates the sedative action. This combination of drugs proved so effective that nervousness and lack

of maternal co-operation ceased to be regarded as contra-indications to local analgesia. In fact, it is probable that a considerable number of forceps operations could be performed under this injection alone.

The question obviously arises as to the effect of these drugs on the foetus. Judging from the small number of cases in which we used them, they do not have a significant respiratory depressant effect. In reaching this conclusion we assessed the results against those obtained when local analgesia was used alone, and when general anaesthesia was used for a comparable series of forceps operations in 1951. (See Graph 1.)

GRAPH 1.—Incidence of apnoea neonatorum. The last group is of comparable cases of forceps delivery conducted under general anaesthesia in the same practice during 1951.

Contraindications to Local Analgesia

Although the use of local analgesia was widely extended, there remained a small group of cases (amounting to only 6% in our series) where general anaesthesia seemed necessary or advisable. The factors calling for general anaesthesia were as follows.

1. *Unsatisfactory Local Analgesia* (3 cases).—In two of these cases, occurring early in our series, lack of maternal co-operation prevented injection of the local analgesic. In the light of our subsequent experience with supplementary pethidine and chlorpromazine injection it seems likely that general anaesthesia could have been avoided in these cases.

2. *"Dangerous Uterine Contractions"* (3 cases).—In these cases strong uterine contractions were hazardous to mother or baby. Two were cases of deep transverse arrest in patients with previous caesarean section scars, while the third was a case of prolapsed cord.

3. *"Complicated Forceps"* (7 cases).—This group included mento-lateral and posterior face presentations (2 cases), forceps application before full dilatation of the cervix (4 cases), and gross foetal abdominal distension (1 case).

4. *Eclampsia* (1 case).

5. *"Trial of Forceps"* (11 cases).—The indications for this procedure were second-stage arrest in the pelvic cavity with (a) the biparietal diameter not completely down to the ischial spines; (b) so little room at the level of the arrest that application of the forceps blades seemed likely to be extremely difficult; or (c) evidence of marked outlet contraction. Of the 11 cases in this category, four came to caesarean section. No foetal loss occurred, and the only foetal morbidity was a fractured clavicle in a case where shoulder dystocia was encountered.

Management of General Anaesthesia Cases

Our policy was to conduct in the operating theatre these few cases requiring general anaesthesia. Parker advocated this and stressed its anaesthetic benefits. The electric suction apparatus and all the other equipment of the anaesthetist are always readily available, while the fact that the patient is on an operating-table facilitates laryngeal intubation and ensures that the Trendelenburg position can be easily obtained. In our experience it also presents certain advantages to the obstetrician. The ability to proceed immediately to caesarean section is essential in the "trial of forceps" cases,

and also in cases of face and brow presentation in which the best results can be obtained only if attempts at vaginal delivery can be abandoned when the difficulties prove greater

than anticipated (Morris, 1953). Working in the theatre is also of value in the "dangerous uterine contraction" group, because detection and immediate treatment of uterine damage may be called for. Again, the operating-table is more suitable for the use of Kielland's forceps, as it facilitates direct application of the anterior blade; it also allows traction in the true axis of the pelvis, especially if the operator is seated on a 6-in. (15-cm.) stool and the table is elevated as shown in Fig. B.

FIG. B.—Operator seated on 6-in. (15-cm.) stool and with operating-table slightly elevated, allowing traction in true axis of pelvis.

Local Analgesia, Kielland's Forceps and the Foetus

The principal aim of our policy was to combat the maternal anaesthetic hazard, but in its actual operation it appeared to be beneficial to the foetus as well. Graph 2 gives the corrected results for all forceps deliveries during the 12 months' operation of the policy, compared with those of the previous five years, similarly corrected. Graph 3 shows the foetal mortality of the forceps series compared with that for spontaneous cephalic delivery in the same year, 1955-6, similarly corrected. The striking thing is that four foetal deaths attributable to cerebral trauma occurred in the spontaneous group, while there were no such deaths in the forceps group. The use of local analgesia was probably the most important factor in achieving these improved foetal results. A parallel might be drawn between the increased safety of delivery with forceps, particularly Kiel-

GRAPH 2.—Comparison of forceps delivery incidences and foetal results in 1950-4 and present series. Figures for foetal mortality are corrected in each case for: macerated foetuses; babies weighing under 4 lb. (1.814 kg.); gross foetal abnormalities; severe erythroblastosis foetalis; and foetal deaths in labour before delivery was embarked upon.

GRAPH 3.—Comparison of foetal mortality for forceps and spontaneous deliveries in cephalic presentations. The same correcting factors applied as in Graph 2.

land's, under local analgesia, and the safety of external version without anaesthesia compared with version performed under a general anaesthetic. The other possible factor was the replacement of manual rotation by Kielland's forceps rotation (see Graph 4). Assessment of this would clearly involve a complex discussion of the merits of the manual method versus the forceps method of rotating the head. Brief mention will be made, however, of several aspects of the controversy on which we have new evidence to offer.

GRAPH 4.—Foetal loss in relation to forceps technique in cases of malposition of occiput. The same correcting factors applied as in Graphs 2 and 3.

First, the traction force with Kielland's forceps is applied directly to the base of the skull and there is a negligible amount of biparietal pressure. That this is so is clearly seen in Fig. 4 of the Special Plate. In this case the head was so extended in the pelvic cavity that the brow was presenting. Kielland's forceps were applied (Fig. 4a) and simple downward traction exerted. When this reached 60 lb. (27.22 kg.), flexion of the head to a vertex occurred (Fig. 4b) followed by easy delivery. The site of the forceps force was marked by bruising of the pinnae, which lay on the mastoid regions. This finding has been confirmed in another similar case, and it is clear that such movement could not occur if there was any appreciable biparietal pressure. This freedom of movement of the foetal head within the blades, which is not widely recognized, may also account, in part at least, for the diminished traction force said to be needed with Kielland's forceps as compared with the orthodox axis-traction instrument. Kielland (1916) was so convinced of this that he stated categorically that measurement of it was unnecessary!

However, to try to obtain accurate measurements of the force employed, a pair of Kielland's forceps were adapted so that a dynamometer fitted into two slotted pins on the distal shoulders. The lower bar of the dynamometer is elliptical, and can be attached by opening and then closing the handles slightly after the blades have been applied and any asynclitism corrected (Fig. C). Graph 5 shows the results obtained in 55 cases. The range of the traction forces was 15-75 lb. (6.8-34 kg.)—the majority of the readings being between 35-50 lb. (15.9-22.7 kg.). Baxter (1946), who measured the traction force with axis-traction forceps, gives 70 lb. (31.8 kg.) as the critical force beyond which cerebral damage is likely to be sustained, but he does not report a large series. In the "trial of forceps" cases in our series, not more than moderate traction (35-50 lb. or 15.9-22.7 kg.) was employed.

Another factor affording a mechanical advantage with Kielland's forceps is the lack of upward displacement of the head during rotation, which is well shown in Fig. 2 of the Special Plate. In this case it can be seen that once the occiput has been rotated to the anterior position the head is practically delivering itself. This is a common clinical experience.

Summary

It has been found possible to extend the scope of local analgesia to 94% of all forceps deliveries. This has been achieved by the routine use of Kielland's forceps for rotation of the head, and the supplementary injection of a mixture of pethidine and chlorpromazine in certain cases. In addition to the great reduction in the maternal anaesthetic hazard, this policy has produced an improvement in foetal results. The possible factors concerned in this are discussed. It seems likely that the most important fact is that the great majority of the

FIG. C.—Views of Kielland's forceps showing dynamometer fitted to pins on posterior aspect of distal shoulders.

GRAPH 5.—Traction force as measured by dynamometer in 55 deliveries with Kielland's forceps.

operations were performed under local analgesia. This, incidentally, leads to gentleness and accurateness while precluding the use of excessive force.

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REFERENCES

- Baxter, J. (1946). *J. Obstet. Gynaec. Brit. Emp.*, 53, 42.
 Donald, I. (1955). *Practical Obstetric Problems*. Lloyd-Luke, London.
 Gate, J. M., and Dutton, W. A. W. (1955). *British Medical Journal*, 2, 99.
 Jeffcoate, T. N. A. (1953). *Ibid.*, 2, 951.
 Jones, E. Parry (1952). *Kielland's Forceps*. Butterworth, London.
 Kerr, J. M. M., and Moir, J. C. (1949). *Operative Obstetrics*. Baillière, Tindall and Cox, London.
 Kielland, C. (1916). *Mschr. Geburtsh. Gynäk.*, 43, 48.
 Morris, N. (1953). *J. Obstet. Gynaec. Brit. Emp.*, 60, 44.
 Parker, R. B. (1954). *British Medical Journal*, 2, 65.
 — (1956). *Ibid.*, 2, 16.

DIFFERENTIAL DIAGNOSIS OF ANKYLOSING SPONDYLITIS

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[WITH SPECIAL PLATE]

The last 25 years have seen two notable advances in the management of ankylosing spondylitis—namely, the use of deep x-ray therapy, and recognition of the importance of active movement in preventing loss of motion in the spine and limbs. Both the beneficial effects of x rays (Smyth, Freyberg, and Lampe, 1941; Hilton, 1943; McWhirter, 1945; Hart *et al.*, 1949) and the extensive loss of mobility which commonly results from prolonged immobilization (Swaim, 1939) appear to be relatively specific features of ankylosing spondylitis (Smyth, Freyberg, and Peck, 1941; Desmarais, 1953; Sharp and Easson, 1954). Serious complications of x-ray treatment of spondylitis are rare, but the possibilities of aplastic anaemia (Goodman, 1956; Sharp and Easson, 1954) and perhaps leukaemia (Brown and Abbatt, 1955) resulting from such treatment make it very desirable that patients who are unlikely to benefit should not be treated with x rays. From the practical point of view it is therefore important, before advising treatment, to establish the diagnosis as certainly as possible in a patient in whom ankylosing spondylitis is suspected.

"Atypical" Spondylitis

The excellent accounts of Polley and Slocumb (1947), Mowbray *et al.* (1949), and particularly Hart *et al.* (1949) and Hart (1955), render a further detailed description of the clinical and radiographic features of classical ankylosing spondylitis superfluous; the emphasis placed by these authors on the significance of such symptoms as recurrent "lumbago," "sciatica," or "fibrositis," particularly when they occur in young men, are aggravated by immobility, or are associated with diminished chest expansion or iritis, and on the importance in diagnosis of radiographic changes in the sacro-iliac joints (Special Plate, Fig. 1a), has led to more frequent diagnosis at a stage where treatment is likely to be effective.

In a study of 530 patients attending a special clinic for investigation and treatment of spondylitis it was found that

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FIG. 1

FIG. 2

FIG. 3

FIG. 1.—Rotation of head through 180 degrees from right occipito-posterior (a) to left occipito-anterior position (b) by Kielland's forceps under local analgesia has been accompanied by complete rotation of spine. Patient was a primigravida and baby weighed 11 lb. (4.994 kg.).

FIG. 2.—Spine has rotated to anterior position with occiput, without traction or abdominal manipulation. Mechanical advantage obtained by rotation without displacement also demonstrated. (a) Forceps applied; (b) after rotation.

FIG. 3.—Direct application of anterior Kielland's blade between palmar surface of fingers and head, which is arrested in transverse position.

FIG. 4.—Brow presentation (a) which has become flexed to a vertex (b) during traction with Kielland's forceps.

(All illustrations from films taken during forceps delivery, under technical difficulties. Where necessary relevant skeletal features are outlined.)

FIG. 4