my intention is merely to select a few types to make my meaning clear.

The subject is one of great interest, and requires closer investigation. For instance, in some specimens the accessory legs hang from near the pubic arch, they are ventral in position; in another case the parts are displaced dorsally. These two positions are illustrated by the chicks, figs. 16 and 17.

Fig. 17.—A chick with supernumerary legs and reduplicated anus, A A.

So long as sacral teratomata were studied in man alone they were regarded as mysterious or curious. Comparative pathology throws much valuable light on this obscurity. When we find a series of malformations running through all the more important groups of animals from lobsters, worms, star-fish, fish, amphibian reptiles, birds, and mammals up to man, we may feel certain that some common cause underlies their production.

Looking broadly at the group of congenital sacro-coccygeal tumours, it would be idle to deny that a knowledge of their pathology is of the utmost service, even to those surgeons who boast that they are "eminently practical," and affect to despise the scientific side of our art. It would be presumptuous of me to indicate to you the way in which a proper discrimination of these tumours is of the highest importance as a prelude to any form of treatment. It is on account of the absence of a full knowledge of their nature that so many disasters happen when tumours belonging to this group are submitted to operation.

In conclusion, let me strongly urge that more attention be given to these conditions. Such studies cannot fail to make surgeons more philosophical by inducing us to reflect upon matters which at first sight seem outside the range of what are called the practicalities of our daily toil, and which it is too much the fashion to regard as the ultimate aim of surgery.

THE RECIPROCAL EFFECTS OF PREGNANCY AND PARTURITION UPON THE OPERATION OF SHORTENING THE ROUND LIGAMENTS OF THE UTERUS.

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THE operation of shortening the round ligaments (*a*) for backward displacements that are suitable for this mode of treatment, and (*b*) for cases of procidentia and prolapse, where either this operation alone is sufficient, or where the

perineum has also to be restored, is now becoming more and more recognised as a valuable resource of surgery; and nearly every week testimony to its value appears, not only in my own practice, but in reports in the medical journals, especially of France and America. I now perform it about a score of times annually, and with as much confidence in its efficacy as I have in the performance of any other well-recognised surgical operation. I hope soon to give the profession more details of the general results of my growing experience on all points in connection with this method of treatment. Upon two points, however, I think the result of my experience should be given at the present time, and these are—first, the effects of the operation upon subsequent pregnancies and parturitions; and, secondly, the effects of subsequent pregnancy and parturition upon the position of the womb.

Most medical men seem to come spontaneously to the following conclusions: (1) that shortening the round ligaments will prevent the usual course of pregnancy, causing it to terminate in abortion; and (2) that, should pregnancy by any means chance to go to term, and parturition take place, the round ligaments will be so stretched that the old displacement will recur.

These erroneous ideas are, we admit, very natural, especially when we consider the extremely hazy conclusions given in our textbooks as to the mechanism by which the uterus is maintained in its position, both in healthy women who have no displacements, and also in patients whose round ligaments have been shortened. We do not seem to clearly recognise the reason why the uterus should stay where it usually does stay in a healthy woman, and each writer has his favourite cause amongst the many assigned causes. As to the round ligament operation, it is generally assumed that after it the uterus is suspended by the shortened ligaments, that these shortened ligaments have ever after to bear this, which is to them an enormous weight, or the operation will fail, whereas in reality the operation only places and keeps the uterus in such a position that the forces that usually support the uterus can act upon it with the customary efficacy. Except for a slight and only occasionally exercised check action, the round ligaments after operation are usually passive.

These questions have been already discussed by the writer in his work on shortening of the round ligaments, and in different papers on the same subject in various journals, and it would make this paper too long to refer to them here, especially as they are not necessary to the full consideration of the proper subject of this paper.

To return to the main question, it may be said at once that, judging from the writer's experience, the following propositions are true: (1) that the occurrence of pregnancy is favoured in cases of retroflexion and retroversion by the operation of shortening the round ligaments, and that when pregnancy occurs, it proceeds and terminates naturally; (2) that in backward displacements the displacement does not tend to recur after parturition, whilst in cases where the round ligaments have been shortened for procidentia or prolapse, the return of this displacement will largely depend on the amount of destruction of the perineum by the passage of the child.

The proof of these two propositions is of a twofold character: *a*, theoretical considerations; *b*, actual results of operation.

Theoretical Considerations.—It is assumed by many that during pregnancy the round ligaments stretch in proportion to the ascent of the pregnant uterus, and that either pregnancy will be interfered with by the shortened ligaments, or if they stretch so as not to interfere with pregnancy, the woman will, after delivery, have her ligaments as long as ever, and that consequently the displacement will recur.

In these assumptions there are several probable fallacies. It is not yet proved that the round ligaments stretch to any large extent during pregnancy. In the unimpregnated uterus these ligaments run from the internal abdominal ring backwards, and inwards, and downwards, into the pelvic cavity. Without being stretched at all these ligaments will allow the uterus to be raised, in the cadaver, a considerable extent into the abdominal cavity, provided all the other attachments of the uterus are cut through. The uterus and two round ligaments might be compared to the handle of a bucket that

drops into the pelvis in the unimpregnated state, and rises into the abdomen during the impregnated condition.

The normal length would not, however, allow the impregnated uterus to rise into the abdomen as high as it usually does were the unshortened and unstretched round ligaments to maintain the relative uterine attachments at the end of pregnancy that they do in the unimpregnated state, much less would the shortened ligaments allow of such elevation without considerable stretching. Another question must now be dealt with, and that is the way in which the uterus enlarges during pregnancy. We generally consider the enlargement as taking place equally in all directions, but this is probably rarely the case. I first noticed this in my studies in the *post-mortem* room, where in an acutely retroflexed uterus, found accidentally at a necropsy, the fundus was extremely developed, and the round ligaments attached so far forwards that they had practically no control over the retroflexed part. (Hence arose the necessity for the stem pessary in such cases, after operation, until complete involution of the fundus has taken place.) In the few examples of impregnated uteri that I have seen *post-mortem* the same phenomena occurred to a variable extent. In the case of a ruptured uterus removed by me lately from the living, the large fundus uteri appeared high and clear above the appendages, all of which seemed to have their attachments low down on the body of the uterus. The uterus, therefore, in my opinion grows away from the round ligaments, and in the direction of least resistance.

In connection with this question I have looked up some of the recent works on obstetrics. In the American *System of gynaecology and obstetrics*,¹ Dr. W. W. Jaggard says: "The round ligaments grow in length to a degree in correspondence with the ascent of the uterus, and become fourfold thicker. The increase in volume is due chiefly to hypertrophic and hyperplastic changes in the non-striated muscular elements of the upper third, and in the voluntary muscular fibres derived from the deep abdominal muscles for the lower two-thirds. *On account of the relatively greater development of the posterior uterine wall, the origin of these ligaments is apparently moved forward to a point at the junction of the anterior fifth with the posterior four-fifths of the antero-posterior diameter.* Their course at term is from the navel obliquely downward and outward to the inguinal ring. Owing to the axial rotation of the uterus, the left ligament is especially prominent.....At term the tubes seem to originate no longer in the angles of the uterus, but correspond to the middle third of the lateral surfaces." The italics are mine.

Further on, at page 462, Dr. Jaggard refers to the facility with which the uterine cavity will increase at the expense of whatever part of the uterine wall offers the least resistance. Writing of spontaneous rectification in cases of retroflexion of the gravid uterus, the following words occur: "In certain cases the process of spontaneous rectification is extraordinarily protracted. The anterior uterine wall grows upward into the pelvis major, until larger and larger portions of the uterus and fœtus are contained within the abdominal cavity."

In other words the broad ligaments, round ligaments, adhesions, etc., are always partially left behind by the expanding uterus, and can be left still further behind should necessity arise through special shortness of the ligaments, strong adhesions, etc. *Post-partum* involution of the uterus tends to restore the position of parts to that which existed before pregnancy.

Hence I hold, theoretically, that in pregnancy the shortened round ligaments are not much strained because: 1. The distance from the internal ring to the site of their attachment to the uterus is probably not greater than in the pregnant and unimpregnated uterus. 2. That any strain during pregnancy upon the shortened ligaments does not so much produce stretching of these ligaments as development of the uterine cavity in a direction that does not increase the strain, and consequently the attachment of the ligaments apparently to a part of the body of the uterus much nearer the cervix than usually occurs. 3. That any stretching of the ligaments that may occur is probably rectified by *post-partum* shortening, and that both uterus and ligaments reassume, if involution has been natural and complete, as nearly as possible the condition that existed before pregnancy took place.

¹ *Obstetrics*, vol. i, p. 340.

Such are the theoretical explanations of the undoubted fact that pregnancy and parturition are not necessarily, or hardly ever, interfered with by the operation of shortening the round ligaments.

At first the operation was performed on elderly women, or on those not likely, for various reasons that need not be more definitely stated, to have children. Very early in the operative history of my treatment of these cases, pregnancy occurred, and resolved my own doubts upon the matter.

CASE I.—Mrs. B., aged 24. Retroversion after the birth of a child three years previously; uterine troubles, cessation of menses a year ago; epilepsy, dysmenorrhœa, etc. This patient was admitted into hospital to be treated for a severe burn sustained during a fit. The epilepsy occurred in connection with the menstrual periods, hence a vaginal examination, and the discovery of the displacement. The round ligaments were shortened on March 16th, 1881, and the fits soon after ceased. During the summer of 1882 she became pregnant, and was delivered, in the early part of 1883, of a child. She was attended by a midwife, and nothing special was observed either in the pregnancy or parturition by the mother or the midwife. I was able to exhibit this patient to members of the British Medical Association in 1883, where several gynaecologists verified my statement that the uterus was in excellent position. Since that time another child has been born, and with the same immunity from displacement.

CASE II.—Mrs. G., aged 38, consulted me in the beginning of 1887 for pelvic pains, dragging, and general discomfort. She had been married seventeen years, and had had no children; menstruation regular, but scanty and painful. An examination showed a retroflexion that could without much difficulty be reduced by the sound. After consultation with Dr. Grimsdale, the operation of shortening the round ligaments was recommended. The operation was performed on January 7th, 1887, and both it and the after-treatment was quite uneventful and successful, from surgical, anatomical, or therapeutical points of view. She became pregnant in July, 1888, and her pregnancy was only marked by the fear that possessed her lest a miscarriage should take place. No symptoms of any such thing ever threatened, and her mind became much easier after the seventh month had passed. On August 8th, 1889, I attended her in her confinement, and she was safely delivered of a girl. The pains were very sluggish in the second stage, and the short forceps were employed at the last. She recovered without any bad symptoms. The child is now quite strong and healthy, and the uterus is in excellent position. The operation in this case reached the highest point of success possible to it, and I think the satisfactory results may all be fairly ascribed to it.

CASE III.—Mrs. P., aged 36, was recommended to me as a suitable case for my operation by Dr. Grimsdale. She suffered from the usual effects of an acute retroflexion, dragging pains, weariness, leucorrhœa, dysmenorrhœa, and sterility for four years, her symptoms dating from the birth of a child at that time. The operation was performed on January 24th, 1886. The operation proceeded satisfactorily, but convalescence was retarded by one of the buried stitches keeping up a small fistulous opening that was only cured by removal of the stitch. On July 10th, 1888, the ordinary medical attendant of the lady informed me that she was pregnant. He said: "She is very large, and complains, especially when tired, of sharp pains on each side where the incisions were made..... Her health is first rate in every way, and the operation seems in her case to have been a complete success." On August 8th he wrote: "You will be glad to hear Mrs. P. is well over her trouble, and has a very fine boy. She had a rather hard labour, and very considerable, though not alarming, hæmorrhage afterwards." The convalescence was watched with great care by Dr. Stoney, and was quite satisfactory. On July 10th, 1889, I received a letter from the patient herself, in which she said, "I have not been so well for years."

CASE IV.—Mrs. S., aged 28, suffered from the usual symptoms of retroflexion since the birth of her last child three years ago. Her mind was much upset with the severity and worry of her pelvic troubles. She was operated upon on November 29th, 1886, and delivered of a child on February 1st, 1888. On January 4th, 1888, she wrote: "I have been feeling far from well this

few weeks, having the false labour pains. I thought I would send you a line to see if it is right for it to be so." No other symptom occurred, and a daughter was born on the date above mentioned. I have seen this lady several times since, and the womb remains in excellent position.

CASE V.—Mrs. D., aged 32, had her last confinement on October, 1883. Since that time she had suffered from the following symptoms, described to me by Dr. Paton, who has attended her for years: "Nervous symptoms, flashing hot pains in legs, weak dull pain in back, general debility of a pronounced type. The burning pains in the legs were at times very severe, and she had frequent hysterical attacks." Some dysmenorrhœa, leucorrhœal discharge at times, and a distinct retroflexion complete the outlines of the picture. The operation was performed on February, 1888, and she was delivered of a son in April, 1889. Dr. Paton concludes his letter to me about her by saying: "Since the operation she has been much stronger, and nearly free from nervous symptoms."

CASE VI.—Mrs. R., aged 28, admitted into the Royal Southern Hospital on October 1st, 1888. She is the mother of two children, the youngest 4 years of age. Since the birth of this child she has suffered more or less from backache, pelvic pain, and discharge from the uterus. At first she was treated for ulcerated womb, then a Hodge's pessary was worn for six months, and afterwards a ring pessary for another six months. Finally a lacerated cervix was operated on nine months ago without relief. Patient very thin, anxious, and nervous. She suffered from acute retroflexion, ulceration of os, with a prolapsed enlarged ovary. She was operated upon on October 1st, 1888. The wound healed by the first intention, and the patient was discharged in six weeks looking plump and bright. She came occasionally to show herself afterwards, and at the beginning of the present year she came complaining of pains in her side. She was then far advanced in pregnancy, and at the end of March she was delivered of a daughter. I heard casually that she had had a miscarriage previously, caused by a doctor passing a sound to ascertain if the uterus was in position. If this was so, pregnancy must have occurred very soon after the operation in this case. I have not been able to verify the position of the uterus in this case.

CASE VII.—Mrs. B., aged 32, mother of one child, was admitted into the Royal Southern Hospital on September 11th, 1888, suffering from prolapse, the cervix protruding from the vulva. Much dragging and some pain accompanied the displacement. The round ligaments were shortened, and the perineum restored on September 13th, 1888. The after-course of the case was satisfactory, and the woman was confined on March 20th, 1890. The labour proceeded satisfactorily, except that the perineum was very much lacerated, and was not stitched up. A midwife only attended her. She came to me three months afterwards complaining of dragging pain. Her perineum had almost disappeared. I inserted a small ring, and I heard the other day that she was quite comfortable.

These cases only include those that have casually come under my observation. I have heard of several others, but have been unable to follow them up. I think these prove practically the propositions before mentioned.

CASE OF PUS IN THE PERICARDIUM TREATED BY INCISION AND DRAINAGE.¹

By HERMANN BRONNER, M.D.

E. S., aged 11, a healthy girl, who had up to the time enjoyed perfect health, awoke ill on February 15th, 1890, during the prevalence of the influenza epidemic. Her temperature was 101.5°, pulse 100. She vomited, her tongue was bad, and, as her illness was attributed to unsuitable food on the day previous, three gr. ij doses of calomel were given, acting promptly. In the afternoon there was much pain in the region of the cæcum, which was tender to pressure. Ice bags were applied all night, with a view to the possibility of typhlitis. On the following morning the temperature, which had risen to 102° in the evening, fell to 100°, and the child

seemed much better, all pain having disappeared. In the evening, however, the temperature rose to 104°, pulse to 122, respirations to 24. On the three following days the child was very ill, temperature, pulse, and respirations remaining unchanged, but absolutely no symptom pointing to the nature of the illness (no pain, no cough) could be discovered, despite the most careful examination by myself and Dr. Major, who subsequently saw the child in consultation with me. On the evening of the fifth day a small area of tubular breathing was discovered under the angle of the right scapula, but no crepitation. On the sixth day this area of tubular breathing was slightly larger, there was slight impairment of percussion note; no crepitation, no expectoration or even cough. On the seventh day crepitation of a rather coarse character was heard over the base of the right lung, dullness was more marked; tubular breathing was absent at times, at times distinct. On the ninth and tenth days respirations rose from 24-26 to 44-54. The temperature, which had always remained high (104° in the evening), fell to 100.2° after sponging on the morning of the ninth day, and we hoped for the crisis. But it rose again in the evening to 104°, and, as the child seemed much worse, antifebrin gr. viijss were given, antipyrin having previously caused violent sickness. Temperature fell to 96°, with great perspiration, the child seeming much collapsed. At noon the thermometer again showed 104°. An ominous pallor now set in; there was great restlessness, tremor of hands and head, the lips were parched and pale, and we feared the worst. Antipyrin gr. xv was then given by the rectum. The effect was very marked. The temperature fell to 98.2°, rising to 101° again in the evening, measuring 100° at 2 A.M. The tremor and restlessness disappeared, the child felt comfortable, and slept for some hours, the first time for several nights. Still no crisis set in. Temperature rose to 102° at noon, the tremor, pallor, and restlessness returning. Antipyrin gr. xx was again given by the rectum, with the same marked beneficial effect. For the following six days, as soon as the temperature rose to 102°, being taken every half-hour, gr. xx antipyrin were given by the bowel, the temperature thus being kept below 100° for the greater part of the twenty-four hours. The dose was only required twice, at the most three times, in the twenty-four hours.

On the morning of the eleventh day there was typical crepitation redux all over the area of the lower lobe of the right lung. Still no crisis set in. This was accounted for by the appearance of pneumonic symptoms over the apex of the left lung on the twelfth day. The pneumonic process then crept slowly through the apex to the front, the cardinal symptoms being still more irregular than they had been on the right side, crepitation especially being of a very coarse character. Dullness extended in front not lower than the second intercostal space, behind half way down the scapula.

On the right side, in the meanwhile, whilst crepitation was diminishing, the dullness gradually became more marked, and it became evident that there was pus forming in the right pleura. This was confirmed by aspiration on March 4th, the sixteenth day of illness, and on March 7th, Mr. Meade, who had seen the child together with Dr. Major during the previous week, made an incision in the sixth intercostal space, behind the axillary line. A pint and a half of sweet pus was withdrawn, and two drainage tubes were inserted side by side, at the suggestion of Dr. Major, for the purpose of eventual irrigation. As three days after the operation the temperature did not go down, the cavity was washed out daily with 5 per cent. boric acid solution, until the fluid ran off clear through the free tube. After three irrigations the temperature went down to 97.8° in the morning, and 99.8° in the evening, and remained so for the next eight days, during which irrigations were not continued.

Still pulse and respirations did not diminish, measuring 140 and 45 respectively. There was clearly still some mischief at work, which Dr. Major and myself vainly tried to discover. An aspirating needle was passed into the seventh intercostal space in the right scapular line, in the hope of finding encysted pus, but in vain. Respirations grew more frequent, necessitating raised position in bed. On March 18th, Dr. Major noticed a slight increase of the area of dullness over the heart and faintness of the heart sounds, and mooted the possibility of fluid in the pericardium. In the course of the following two days dyspnoea increased very

¹ Abstract of a paper read before the Bradford Medico-Chirurgical Society.