Gynaecological Conditions.

I need only refer again to the three conditions: rupture of an ectopic gestation, acute salpingitis, and acute septic metritis, and to say that when the patient is an adult female one must always bear them in mind.

In conclusion, gentlemen, it is a matter of congratulation that while the causes of an "acute abdomen" are not apparently on the wane, the gravity of the condition is becoming more and more recognized, and its early diagnosis, which is a matter of supreme value, arrived at in a much larger number of instances. We must look forward to the day when all "acute abdomens" will be recognized within the first few hours of their sudden onset, and surgical treatment carried out with the least possible delay.

A NOTE ON INJURIES TO THE FEMALE URETER.

BY

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KELLY AND BURNAM¹ state that injury to the ureter is the most common complication of pelvic surgery, whilst Burney² has collected sixty-two such cases, of which sixteen were bilateral; probably the bulk of such accidents are either overlooked or not reported. The course of this duct and its surgical relationships make it peculiarly liable to injury in women. Certain anatomical points are worthy of notice:

1. The female ureter enters the pelvis behind the infundibulo-pelvic fold and its contained vessels, and may readily be injured during ligation of the ovarian artery, particularly if the fold is put on the stretch and the needle passed close to the pelvic wall.

2. Curving forwards below the pelvic brim the ureter lies above the suspensory ligament of pelvic fascia (Paterson³) in close contact with the posterior leaf of peritoneum—an important and constant surgical landmark even in fat subjects.

3. At the base of the broad ligament the duct is crossed in front by the uterine vessels, and not uncommonly has an additional artery behind it (an accessory uterine or vaginal branch).

4. The ureter perforates the parametrium at a distance of about three-quarters of an inch from the cervix, where it is enclosed in a fibrous tunnel (the so-called ureteric canal), and surrounded by veins derived from the vaginal and vesical plexuses.

5. The terminal part has variable relationships, as shown by Hellier,⁴ but it may be said to lie on the roof of the lateral vaginal fornix.

The possibility of injury is always present when ligating the ovarian and uterine vessels, and when dividing the attachments of the broad ligaments, cervix, vagina, and bladder. This risk is reduced to a minimum in ordinary cases if the operator (1) works entirely within the course of the duct; (2) avoids the pelvic wall when tying the infundibulo-pelvic fold and ovarian vessels; (3) divides the broad ligament close to the cervix; and (4) pushes the bladder well down before opening the vagina.

In Wertheim's operation, however, full exposure of both ureters is essential, and such dissection may be the easiest way to avoid injury in other cases, particularly where burrowing fibroids and intraligamentary cysts have led to anatomical dislocation, and perhaps distension from pressure. At all times free bleeding may occur to obscure the relationships and increase the likelihood of the ureter being mistaken for a vessel or band of peritoneum. Identity must be established by one or more of the following tests:

1. Kelly's vermicular contraction test—that is, waves of peristalsis produced by stroking the ureter—pathognomonic when seen.

2. Absence of pulsation.

3. Consistency and thickness of wall; the ureter is much thicker and harder than a vein and thicker and softer than an artery.

4. Familiarity with surgical landmarks, especially attachment to the posterior leaf of peritoneum (described above); no blood vessel hugs the peritoneum in this way.

Results of such injuries may be summarized as follows:

Bilateral.

- (a) Double section; leakage with general infection and death.
- (b) Double ligation, with anuria; fatal if unrelieved. Treatment consists in either releasing or implanting one or both

ureters, or in draining the kidneys by nephrostomy. Two typical cases may be quoted of double ureteric ligation. Caulk and Fischer⁵ record a case operated on successfully after eight days' suppression in which double nephrostomy was performed. It is interesting to note that fifty-nine days later complete canalization of the ligated ureters had taken place, and all the urine was being passed via the bladder. Cuthbert Lockyer⁶ mentions a similar case in which he implanted one ureter into the bladder and removed the opposite kidney with complete recovery.

(c) In those cases, undoubtedly rare, in which only one kidney or normal kidneys and only one ureter are present, a single injury is functionally a double one.

Unilateral.

(a) Section, with leakage; acute infection.

(b) Partial section, with subsequent leakage and fistula formation.

(c) Ligation, atrophy of kidney with or without symptoms of renal insufficiency (acute or chronic uraemia).

(d) Ligation, reflex suppression with complete anuria.

The ideal treatment (as in bilateral cases) is immediate repair or implantation, but usually such manipulations are difficult and increase shock by prolonging the operation; they may also be followed by secondary contracture and obstruction at the site of repair unless there is a complete absence of tension.

Simple ligation of both ends of the cut ureter has been practised deliberately by many surgeons, generally without harmful sequelae if the remaining kidney is healthy. Atrophy of the affected kidney is preceded by distension but no true hydronephrosis develops; pain in the loin and tenderness on palpation with tachycardia are the commonest symptoms, often so trivial as to be overlooked by surgeon and patient. If the remaining kidney is unhealthy and unable to take on additional work uraemic symptoms appear. Rarely complete anuria may follow from reflex suppression, as the following case illustrates:

Mrs. D., a widow, aged 51, was admitted to Shaw Street Hospital for Women, March 20th, 1920, with a history of eighteen months' excessive bleeding at the periods and slight recent leucorrhoeal discharge. She also complained of shortness of breath on exertion and some loss of flesh.

The cervix uteri was thickened and contained a nodule that bled readily on examination; it was therefore decided to remove the uterus by Wertheim's method for early carcinoma. This was carried out on March 22nd. The left ureter was cut at the pelvic brim when ligating the ovarian vessels. Implantation being considered impracticable, both ends were tied off and covered with peritoneum. Otherwise the operation presented no unusual features, and the patient's general condition immediately afterwards was quite satisfactory. The following is an extract from the notes of the case:

March 23rd (day after operation): Patient restless; slept little; a good deal of pain and a little vomiting. Temperature 99.4°; pulse 92; 3 ounces of urine passed during night. March 24th: Less pain; no vomiting; has passed flatus and is retaining salines. Temperature 100.8°; pulse 104; 9 ounces of urine passed yesterday, and 12 ounces this morning. March 25th: Suppression of urine since 7 p.m. last night; bladder empty; hot packs ordered with salines and fomentations to the loins; pilocarpine 1/10 grain, pulv. jalapae co. 30 grains. 6 p.m.: Bladder still empty; patient sweating freely; theocin 5 grains two-hourly. March 26th: Suppression continues; oedema of face, ankles, and hands; irregular breathing during the night; patient quite clear mentally; complains of severe headache; slight diarrhoea; no vomiting; no muscular twitchings; moderate cyanosis. Temperature 100.8°; pulse 120.

I saw her when anuria had persisted for forty-one hours; there had been no response to conservative measures; the cyanosis was marked and the general condition alarming; fortunately there was no doubt as to the patency of the right ureter; I therefore decided to decapsulate the right kidney. This was done under light ether anaesthesia. The kidney was quickly delivered and found to be deeply congested, dark blue in colour and hard in consistency, but otherwise showed no sign of disease. After incision of the capsule the edges were quickly separated by bulging renal substance, demonstrating an obviously increased intrarenal tension. The capsule was stripped up and excised and the wound closed with one layer of sutures—the whole operation lasting fifteen minutes. Three hours later 3½ oz. of urine were removed by catheter; 62 oz. were passed in the following eighteen hours and altogether 4½ pints in the forty-eight hours succeeding operation.

Convalescence was uneventful, and in spite of a mild attack of cystitis and parotitis the patient left hospital on April 27th, 1920, looking and feeling well. She had no symptoms of renal insufficiency and MacLean's test gave a urea excretion of 2 per cent. Polyuria was absent; the specific gravity was maintained above 1015, whilst the average amount of urine passed daily for thirty days was 28 oz., an amount stated by Foxwell⁷ to be normal for a healthy woman. In view of these findings it was not considered necessary to estimate the urea blood content or to use colorimetric methods. At the present date (twenty months later) she remains quite well.

This case illustrates certain points in the pathology of anuria and emphasizes the important part played by vascular changes in the production of this condition. It must be noted that three chief factors are concerned in producing diminution of the urinary secretion:

1. Circulatory (spasm or thrombosis), the result of (a) direct action on the vessels of bodies such as turpentine; (b) indirect action of poisons or toxins acting through the vasomotor system.

2. Epithelial changes, either (a) primary, the result of toxins (for example, diphtheria), or (b) secondary to vascular changes or nervous trauma.

3. Obstruction to the tubules, which may be (a) extracapsular—renal calculi—or other gross pressure on or in the ureters from bilateral neoplasms, or untreated injuries, or (b) intracapsular—arising from purely vascular changes, inflammatory exudates (for example, acute nephritis), or possibly degenerative lesions (? eclampsia).

Probably several of these factors are in action at once, but there is a type of case in which the kidney is hard and congested and gapes through the split capsule; here intracapsular or intrarenal pressure is playing the chief part by crushing the renal epithelium against the unyielding capsule. This pressure can be relieved by decapsulation or by various medicinal methods. The value of veratrine (recently emphasized by Bourne⁶) and morphine in eclampsia is probably due to their effect in lowering the general blood pressure and so reducing intrarenal tension. Similarly methods which were said to diminish toxæmia (purgatives, diaphoretics) may act in the same way by depleting the circulation. It is unfortunate that decapsulation should always be associated with the name of Edebohls, who practised it almost entirely for chronic nephritis. He maintained that new vessels were formed between the denuded kidney and its fatty capsule, and that this anastomosis, by increasing the renal circulation, promoted the absorption of inflammatory tissue and led to the regeneration of renal epithelium. Many observers have failed to confirm his findings; as Boyd and Beattie⁹ point out, such adventitious vessels may be formed, but they probably fail to do more than compensate for the capsular vessels ruptured by the operation. The real indication for decapsulation is an acute increase in intrarenal pressure; this is not seen in the kidney of chronic interstitial nephritis, in which the effects of pressure are neutralized by protecting bands of fibrous tissue.

Harrison,¹⁰ the real pioneer, who anticipated Edebohls by two years, was clearly familiar with this condition, for he describes the hardness of the kidney and compares the increased tension with that seen in the eye in glaucoma. It is further interesting to note that his first three cases were distinctly medical or toxic in type, and due to scarlet fever, influenza, and nephritis from cold respectively. Clifford White¹¹ has advanced important evidence in favour of the presence of increased intrarenal pressure and the value of decapsulation in eclampsia. There is, however, a tendency to regard suppression as a purely toxic condition, and if not unsuitable for operation, at least only suitable when all conservative measures have failed. No doubt the vascular changes are greater in some cases than others—for example, Rose Bradford¹² states they are marked in the acute nephritis of scarlet fever and slight in that of diphtheria. But although toxæmia may be the chief pathological agent, vascular changes are rarely absent; they lead to further impairment of function, and establish a vicious circle in which a rising intracapsular pressure is the important pathological mechanism.

It is, of course, essential to treat toxæmia and give conservative remedies a fair trial, but it is unfair to expect decapsulation to be useful in the terminal stages when thrombosis and necrosis have occurred and the renal epithelium is irremediably damaged. I would urge that in any acute suppression of urine (partial as well as complete) where the patient is not responding to treatment an early decapsulation should be seriously considered.

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- ¹ Quoted by Caulk and Fischer, *Surg., Gyn. and Obstet.*, vol. xxx, p. 343. ² *Trans. American Urolog. Assoc.*, 1919. ³ *Journ. Anat. and Physiol.*, vol. xii, p. 102. ⁴ *New System of Gyn.*, vol. iii, p. 644. ⁵ *Surg., Gyn., and Obstet.*, vol. xxx, p. 343 et seq. ⁶ *New System of Gyn.*, vol. ii, p. 246. ⁷ Quoted by Box, *BRITISH MEDICAL JOURNAL*, March 13th, 1920. ⁸ *BRITISH MEDICAL JOURNAL*, May 29th, 1920. ⁹ *Edin. Med. Journ.*, 1905, p. 337. ¹⁰ *Lancet*, Aug. 3rd, 1901. ¹¹ *Proc. Roy. Soc. Med.*, 1919, vol. xii. ¹² Clifford Allbutt's *System*, vol. iv, Part I.

A Lecture

ON

THE AXIS OF ASTIGMATISM.*

BY

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RECENTLY I had an inquiry from a practitioner engaged in eye work at a school clinic in South Africa, asking advice on the best and most accurate method of determining the axis of a cylinder necessary for correcting an astigmatic error of refraction; the same question has been put to me this week. I therefore propose to deal with this practical point.

First, we must consider the mental attainments of the patients whose visual defects we propose to diagnose and correct. Our patients are children—school children—their ages run from, say, 5 to 14 years. Those of the earlier years it may be taken will certainly not have developed any notable powers of observation; and since our working arrangements must be adapted to suit the conditions of the feeblest member of the clinic, it follows that the whole of the refraction work done for children must be objective and not subjective. It is no use asking a child whether this or that glass is better than another, or what difference this lens of a fraction of a diopetre makes to clearness of vision. The child cannot be expected to tell. Those of you who wear glasses will know how difficult it is to determine between the advantages of two slightly different lenses when used to view the test type, and how much more difficult it is to set a cylindrical lens of low power exactly in the best axis. If this be so in the case of an educated adult, what can you expect of a child? Subjective tests are of little or no value in a children's clinic, and no use should be made of them except to obtain a record of visual acuity under given conditions, and even then the record must be used with due caution, bearing in mind the strangeness of the conditions of the examination to the child, and the likelihood of variations in understanding and intelligence.

No man is fit to take a share in this work of a school clinic who is not a master of the art of retinoscopy. That is the one test of competency for this work. A knowledge of external diseases and their treatment is necessary; ability to use the ophthalmoscope and determine fundus conditions is needed; but, seeing that nine-tenths or more of the work of these clinics will be to determine the cause of a suspected or known defect of visual acuity, competency in the art of retinoscopy is the outstanding requirement. The worker must be such a master of the art that he can, by the use of his mirror and lenses, both discover all the details of the refraction and judge from his results what will be the most appropriate glasses to order in any given case. Short of possessing this mastery of the art, there is no place for him in a school eye clinic.

Further, a school clinic is not the place in which to acquire this mastery. It can only be obtained by regular and assiduous work with critical patients. To the seeker after this knowledge I would advise a course of practice with young adults—those whose faculties are well developed, and who can give good responses to subjective tests; and he should choose those for whom the suppression of the power of accommodation for a few days by the use of atropine will be no detriment to their work. There will be found plenty such in any ophthalmic clinic of a teaching hospital, and with their aid he will be able to check his capacity for retinoscopy.

The following is a plan which may be recommended:

1. Ascertain the visual acuity of each eye of your test patient on the usual Snellen's types.
2. Make an attempt to improve any defect of vision by the use of trial lenses.
3. Examine the refraction by retinoscopy without the use of a mydriatic.
4. Instil an oily solution of homatropine and cocaine, 2 per cent. of each. After an interval of one hour do another retinoscopy; and then ascertain the visual results obtained with the correction arrived at by the retinoscopy.
5. Order an oily solution or ointment of atropine and cocaine, 1 per cent. of each, for use thrice daily for two days. Then

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