

opinion that, had the right kidney been removed in 1883, or at any time within twenty years after, this arteritis would have been prevented.

The evolution of our knowledge of urinary tuberculosis, particularly the great progress that has been made in its earlier recognition, constitutes one of the most interesting and beneficent advances in neurology that have occurred within our time. Our present-day ability to recognize the existence, and often also the extent, of tuberculous change in a kidney from the cystoscopic appearance of the corresponding ureteric orifice—and this we owe largely to the work of my fellow countryman E. Hurry Fenwick—always appeals to me as the most fascinating of the cystoscope's innumerable and priceless contributions to urology.

Murphy considered renal tuberculosis to be usually a blood-borne infection, the bacilli entering the blood, by way of the lymph stream, from a primary focus in the bronchial glands. He believed (1) that in visceral tuberculosis tubercle bacilli may be found in the urine even in the absence of a tuberculous focus in the kidney, (2) that in the great majority of early cases the disease was unilateral, and (3) that early cases could be cured by non-operative measures, prominent among which he placed the injection of tuberculin. In the fifteen years that have elapsed since Murphy's death, although considerable discussion has ranged around these same three questions, and much clinical and experimental investigation has been carried out, no general agreement has yet been reached. Many recent workers now hold (1) that "secretory bacilluria" does not exist, and that the presence of the tubercle bacillus in the urine from a kidney denotes the actual existence therein of a focus of tuberculosis, even if microscopical only; (2) that renal tuberculosis is at first a bilateral condition; and (3) that the initial renal lesions frequently heal.

Despite these divergent opinions, the surgical position of to-day does not differ materially from that of Murphy's time. Renal tuberculosis, if clinically unilateral, should be treated by nephrectomy, whereas, in clinically bilateral involvement, nephrectomy should be performed only very exceptionally, as when there is severe pain, haemorrhage, or acute sepsis in a tuberculous kidney, whose fellow is but slightly affected.

In tuberculosis of the epididymis, Murphy was a forceful advocate of the conservative operation of epididymectomy as opposed to castration. He wrote: "There is no more occasion for taking out the testis proper in the early stages of tuberculous epididymitis than there would be for taking off the caput coli if you had a case of appendicitis." The treatment Murphy recommended was the removal of the epididymis, and as much of the vas as could be reached from the groin; he never excised a seminal vesicle, and shortly before his death stated that he had never seen a case presenting clinical evidences of tuberculous involvement of a seminal vesical that did not entirely heal after epididymectomy, without further operation. These views, as is well known, are strongly opposed by H. H. Young, who, however, is at one with Murphy in protesting emphatically against the unnecessary removal of the testis, which hitherto has been so frequently practised.

PROSTATECTOMY

In his earlier work in radical prostatic surgery Murphy removed this gland by the perineal route, and in 1904 recorded fifty-one perineal prostatectomies with one death. From this time onward, however, he regarded the suprapubic route with steadily increasing favour, and shortly before his death stated that he removed all his enlarged prostates suprapubically. This gradual change of attitude towards perineal prostatectomy is typical of the majority of surgeons whose work has covered approximately the

same period, and the oft-debated question as to the relative merits of perineal and suprapubic prostatectomy would appear to have been decided, for the present at any rate, in favour of the suprapubic. Nevertheless, you have in this country the world's greatest perineal prostatectomist in the person of Dr. H. H. Young—the arch-protagonist of the operation itself. At the hands of the average surgeon, however, and not of a super-surgeon, perineal prostatectomy carries with it the two dangers of wound of the rectum and of defective sphincteric control, and these, combined with the greater ease of performance of the suprapubic operation, account for the present-day preference for the latter.

In recent years, the death rate of prostatectomy from its former two chief component factors—renal insufficiency and haemorrhage—has been greatly lessened, and it is infection that now constitutes its most serious risk.

One form of this infection of especial interest is post-operative epididymitis, the frequency of which has been varyingly stated as being from 20 to 39 per cent. Since in the vast majority of the cases the infection is conveyed along the vas deferens, division of the vas can be relied upon to prevent epididymitis provided it be performed before the organisms have reached the epididymis. Murphy recognized this, and wherever the history disclosed a former epididymitis, however mild, he always divided the vas bilaterally immediately prior to removing the prostate; he does not appear, however, to have adopted it as a routine procedure. Since 1922 I have divided and ligatured the vas on both sides in all my prostatectomies, and I have not met with a single case of epididymitis in 177 consecutive operations. There can be no objection to vaso-ligation from the point of view of future sterility, since, in any event, the patient after prostatectomy will almost certainly be sterile, though far from necessarily impotent. Indeed, if there be any truth in Steinach's contention that vaso-ligation leads to "rejuvenescence," then the patient gains this additional benefit.

CONCLUSION

The time allotted to me will not permit of reference to the many other interesting features of Murphy's work in urology, but I trust that enough has been said to indicate that, as in other fields to which your previous Orators have drawn attention, so in this field of urinary surgery Murphy held a foremost place, and was, in many respects, a pioneer.

SHOCK FOLLOWING BLOOD EXTRAVASATION

WITH SPECIAL REFERENCE TO THE TREATMENT OF
ACCIDENTAL HAEMORRHAGE*

BY

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In April, 1931, at the eighth International Congress of Obstetrics and Gynaecology in Glasgow, I brought forward twenty-eight cases of albuminuria which were observed to appear as a result of absorption from recent locked-up blood extravasations.

In all the material considered some degree of shock was present, and it was evident that the severity of the shock which could be induced by reabsorption from a blood effusion depended on the facility of reabsorption rather than on the quantity of blood which was extravasated. As an example of this, there was one case in which the total quantity of blood extravasated was

* Paper read in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Eastbourne, 1931.

approximately three-quarters of a pint. There was no previous loss in this case, and before the blood effusion the blood pressure was 126 mm. Hg. One and a half hours after the rupture of a tubal pregnancy and extravasation of the three-quarters of a pint of blood the blood pressure had fallen to 68 mm. Hg. There was a fast feeble pulse, subnormal temperature, pallor, sweating and restlessness. From the time of removal of this small extravasation the blood pressure rose steadily, and in six hours had reached 100 mm. Hg.

Still more interesting was the marked shock and blood-pressure collapse which followed the formation of a small effusion in the perineum, due to the tearing of a blood vessel at the time of delivery. In this woman the blood pressure fell from 115 to 90 mm. Hg in the course of half an hour. Symptoms and signs of shock were well marked, and the removal of about 2 oz. of effused blood immediately restored the blood pressure and the general condition.

Other instances have been noted in which a similar sequence of events followed blood effusion, and made it evident not only that severe shock was induced by reabsorption from blood effusions of small size, but that the clinical condition could be accurately estimated by blood-pressure readings.

The points which I wish to bring before you to-day are the intimate relationship between certain blood extravasations and the subsequent urinary and blood-pressure disturbances, and the fact that these, taken in conjunction with clinical phenomena, constitute obstetric shock. I wish also to illustrate the effects of, and to attempt to impress the necessary indications for, the various means of active treatment of shock.

TECHNIQUE OF OBSERVATIONS

The following points were investigated from the time the patient first came under observation: two-hourly records of systolic blood pressure, pulse rate, and temperature; estimation of the volume of urine and its albumin content (specimens were taken four-hourly as a routine, in some instances two-hourly by catheterization); full notes on the clinical condition and the effects of treatment on blood pressure and urinary phenomena.

From the material under consideration it appears very definitely that shock is produced by reabsorption from altered blood effusion, and that the first symptom in the onset of shock is a fall in blood pressure. Almost simultaneously with the fall in blood pressure the pulse rate becomes slower, the diminution in its volume not being appreciable save with the aid of a sphygmomanometer. This initial fall in blood pressure may be approximately 10 to 15 mm. Hg, but varies in individual cases.

Coincident with the further fall in blood pressure there is an increase in the pulse rate to between 100 and 120, with further loss of its volume. Sweating, pallor, flaccidity of muscles, with restlessness, coldness, vomiting, and a sense of faintness, overcome the patient. This change may be expected when the blood pressure reaches the 100 mm. Hg level, and the symptoms become more urgent as the blood pressure falls.

In the event of the blood pressure remaining at a low level, or falling still further, the anoxaemia and sluggish renal circulation become more marked. Figures in such examples show diminution in the urinary output with increasing albumin content. From the foregoing remarks, it is evident that should this fall in blood pressure continue, finally there would be no urinary secretion, and the last few drops found per catheter would boil solid. Such has been the case in several recorded instances, and the opposite phenomena are noted when recovery of the blood pressure takes place.

In women in whom the blood pressure reached 40 to 60 mm. Hg, shock was very marked, but in one case recovery occurred even after no reading could be obtained. From this it may be pointed out that recovery can be hoped for, with appropriate treatment, even in the most severe degrees of shock. In the fatal cases which were recorded the blood pressure showed a persistent downward course, and the cause of the shock was found only at post-mortem examination in the form of retroperitoneal and subserous effusions whose volume varied from 2 to 8 oz. If these extravasations had been removed at a safe stage of shock, the patients would almost certainly have recovered.

Professor Tweedy first described the condition which he named "haemorrhagic shock" in 1918. He stated that this was probably due to reabsorption of some toxic product evolved from clotting blood being in contact with fresh blood. This state of affairs would allow very free reabsorption, as it infers that the vessels are still open and capable of reabsorbing any toxic products. He also maintained that relaxation of all smooth muscle was a constant feature of severe shock.

This has been very fully verified in the numerous examples of blood-pressure collapse which I am able to place on record in connexion with blood reabsorption subsequent to extravasation. We may therefore take it as an established fact that the most definite information as to the exact condition of the patient and the state of her smooth muscles is to be determined by blood-pressure observation.

EFFECTS OF VARIOUS TREATMENTS ON SHOCK

I wish now to consider the effects of various treatments on the condition of shock. The routine pre-operative treatment in all the instances which I noted while in the Rotunda Hospital may be summarized as follows:

1. Warmth and elevation of the end of the bed.
2. Hot drinks, rectal coffee salines with brandy.
3. Submammary and intravenous salines.
4. Hypodermically; ether, brandy, camphor in oil, pituitrin, ephedrine, and morphine.

In reviewing these procedures it should be remembered that they are used in conjunction with each other, and their effects are best judged by the response which is obtained in blood-pressure elevation. The most important elements in this treatment appeared to be warmth, fluids, morphine, pituitrin, and ephedrine. The last produces an elevation of 15 to 20 mm. Hg, and its effect is sustained for at least half an hour. In this respect it is far more potent than pitressin, pituitrin, or adrenaline.

Of even greater importance than the prevention of increased extravasation are the removal of already extravasated blood and the prevention of its reabsorption. All these principles are well illustrated by the methods adopted in the Rotunda Hospital for the treatment of accidental haemorrhage. Here it must be emphasized that the cases included are only those which would have produced severe constitutional symptoms had they not been subjected to immediate prophylactic treatment.

On the appearance of the initial symptoms restorative treatment is adopted to combat the shock. This may vary from merely applying warmth to the more energetic routine, such as morphine, ephedrine, salines, etc. The value of submammary salines in this connexion cannot be overestimated. The salines administered are either sodium bicarbonate or sodium chloride, in the strength of 1 drachm to the pint; glucose 5 to 10 per cent. may be added in saline.

The infusion is given with a tube and funnel, to which are attached two large infusion needles. When the saline is flowing, these needles are plunged into the connective

tissue between the gland and the pectoral muscles parallel to the chest wall, the funnel being held 1 to 2 feet above the patient's head. The correct surface marking is known by the fold between the uplifted breast and the chest wall. Full aseptic precautions are very necessary, and it is also most important to administer the right amount of saline at the correct temperature. It should be poured into the funnel at 115° F. so that it will reach the body at 100°. Too cold infusion adds to shock, and sloughing of the breast has followed too hot salines, or excessive quantity. A fair average is one pint under each breast, and this may be repeated every two to four hours, if necessary.

This combined prophylactic treatment will deal with the shock and produce a rise of 10 to 15 mm. Hg. It is therefore of great value, but will not in itself prevent blood flow or reabsorption. In a number of cases labour follows the partial restoration of the patient, and accidental haemorrhage, accompanied by labour, is rarely a serious condition. Even though the labour has started, rupture of the membranes should not be neglected, as it will expedite labour and prevent blood flow with further reabsorption by causing contraction and retraction with closure of the open sinuses. In the event of labour not starting in spite of the restorative methods for raising the blood pressure, the membranes must be punctured, a tight binder applied, and 1/4 c.cm. of pituitrin given at half-hourly intervals until 1 c.cm. is administered. This will cause partial emptying of the uterus, with consequent retraction of the muscle fibres and partial or complete closure of the sinuses.

In the more serious type of cases in which symptoms grow progressively worse in spite of the already mentioned treatment, other procedures must be adopted. Here the blood pressure is in the neighbourhood of 80 mm. Hg; pallor, restlessness, faintness, and sweating are more marked. In these cases there is a continuance of the outflow of blood and its reabsorption. In these circumstances, Sir William Smyly strongly advocated plugging of the vagina by the use of numerous pledgets of cotton-wool squeezed out of lysol solution. He asserted that by this means labour pains were promoted and the os opened. In the same connexion Tweedy claimed that the plugs exerted direct pressure on the uterine vessels.

In later years this treatment has not been so enthusiastically advocated, for the reason that it undoubtedly increases shock. Its supporters, while admitting this to be true, maintain that it hinders, if not altogether stops, the fresh outflow of blood. It is probable that the prejudice against plugging has arisen from the fact that it has been employed in cases where the blood pressure has been in the neighbourhood of 60 to 80 mm. Hg; the additional shock due to this operation has reduced it to a still lower and more dangerous level. In addition, plugging does not remove the cause of the shock, but only prevents further loss taking place. In such low degrees of blood pressure, plugging the vagina should not be considered, as rapid emptying of the uterus by Caesarean section offers the best chances of success.

In the past, much misgiving has arisen in connexion with Caesarean section, for it was considered that in the presence of an atonic uterus the dangers of post-partum haemorrhage would be great. In practice this is not so, as the muscle, though flabby, will rapidly retract on emptying the uterus, with control of the bleeding. This has been the universal experience in the Rotunda Hospital, where the operation was first performed for this condition, and is still adopted with success by the present Master, Dr. Bethel Solomons. There is no doubt as to the claims which have been made on its behalf, and when performed rapidly under ether or gas-oxygen the ensuing shock is small and the recovery rapid.

On the other hand, the statistical report on the operation of Caesarean hysterectomy is very high, probably 50 per cent., under similar conditions. It must therefore be rightly considered an unjustifiable operation.

It must never be forgotten that very severe haemorrhage can occur from rupture of a blood vessel other than in the uterine wall, and extravasations occur into the abdominal cavity as well as into the broad ligaments. This complication can only be dealt with by abdominal section.

It has already been pointed out that it was not in accidental haemorrhage alone that shock was found to develop subsequent to blood extravasations. In such conditions as haematoma of the vulva, ruptured tubal pregnancy, my experience was that shock occurred in a similar manner, and that the degree of shock appeared to depend on the facility of reabsorption rather than on the quantity of blood extravasated.

It must not for one moment be concluded that every case of blood effusion will cause shock; it is only a certain percentage which will develop these phenomena. It is best seen when oozing takes place over a clot, as in this instance the clot mechanically keeps the vessels open and readily allows reabsorption to take place.

CASES ILLUSTRATING SHOCK SUBSEQUENT TO BLOOD EFFUSION

M. C. (1) was first seen with uterine bleeding and blood pressure of 116 mm. Hg at 5 p.m. The bleeding was of no consequence, but, nevertheless, at 7 p.m. she was in marked shock with pallor, sweating, pulse 120, and a blood pressure of 63 mm. Hg. The uterus had been the size of an average six weeks' pregnancy, but was now ballooned out by the detached ovum and about 4 to 6 oz. of blood clot. The uterine contents were emptied, and a hot intrauterine douche given. The blood pressure and urinary output recovered almost immediately, and within two hours the patient could be clinically considered normal.

M. R. suffered from concealed accidental haemorrhage. In spite of all prophylactic treatment, puncture of membranes, etc., the shock persisted, and it was thought the patient would die with any manipulation. When the blood pressure was at 85 mm. Hg, the pulse was almost imperceptible at 120; pallor, faintness, coldness, sweating, and anxiety were very marked. The condition was too critical to temporize by plugging the vagina, and death would have followed any further conservative treatment. As a desperate resort classical Caesarean section was performed with rapid removal of the foetus, placenta, and about three-quarters of a pint of blood clot. The uterus retracted perfectly, though pains were absent, and the blood pressure rose rapidly from the time of emptying the uterus.

In contrast to the cases mentioned, in one of which recovery followed from an apparently hopeless condition, I would like to quote the example

M. C. (2). The blood pressure readings in this case of concealed toxæmic haemorrhage are particularly interesting, as at the onset the prophylactic treatment caused an increase in blood pressure from 136 to 152 mm. Hg. Shock was present in moderate degree, and delivery took place spontaneously at this level. There was no post-partum haemorrhage, but in spite of all prophylactic treatment there was a persistent fall in blood pressure. Shock increased, the blood pressure falling to 48 mm. Hg, and the pulse became imperceptible at 140 to 150. At this stage the woman was quite unconscious. The last reading obtained was: blood pressure 44 mm. Hg., and pulse 148; half an hour later death occurred. This sequence of events took place in the nine hours following delivery, and post-mortem revealed the cause of the progressive shock. The only treatment that could have saved this woman would have been the timely removal by laparotomy of the 6 to 8 oz. volume, partially clotted, retroperitoneal effusion in the neighbourhood of the right kidney.

M. K. was another example of persistent fall in blood pressure after a spontaneous delivery. No loss was visible, but coldness, pallor, sweating, and faintness, with a blood pressure of 65, and pulse 132, were present three hours after

delivery, in spite of prophylactic treatment. The last readings were blood pressure 50, and pulse 156, the patient being restless, cold, and unconscious, with marked air hunger. Post-mortem examination revealed localized haemorrhagic infiltrations through the lower segment of the uterus, the total volume being 4 to 6 oz. Haematomata were present under the peritoneum, and on the interior of the uterus, over this extravasation.

CONCLUSIONS

In conclusion, there are several points which I wish to emphasize.

As already stated, shock can follow blood extravasation, but this is not inevitable. The necessity for reabsorption was pointed out by Tweedy when he stated that shock would occur when fresh blood came in contact with blood already effused into the tissues.

The first step in the production of shock is a fall in blood pressure, and accordingly as the blood pressure falls to lower levels pulse rate and urinary changes become evident.

A persistently falling blood pressure, in spite of prophylactic treatment, is of very serious import, and efforts should be made in the presence of such readings to localize and remove the blood effusion.

Prophylactic treatment is of the utmost importance, especially the several points already detailed. By its

use otherwise inoperable cases will be rendered safe for operation.

In the event of labour not starting after puncture of the membranes, etc., plugging the vagina should be performed without delay, provided that the blood pressure is approximately 80 mm. Hg. Below this level, unless marked improvement in the patient is soon noted, classical Caesarean section should be performed.

I am deeply grateful to the Master of the Rotunda Hospital, who was at all times most anxious to allow the large amount of clinical material under his care to be at the disposal of his assistant.

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THE NASAL ELEMENT IN SPASMODIC ASTHMA*

BY

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I am convinced that many cases of spasmodic asthma are cured or greatly improved by appropriate intranasal treatment of such abnormalities as may be present. At the same time it must be admitted that some cases are not so benefited.

In many cases of asthma there are nasal abnormalities calling unmistakably for treatment, but similar abnormalities may exist without asthma; while, further, cases of asthma occur in which there are no apparent nasal abnormalities. It follows that whatever importance may be attributable to nasal abnormalities in the production of the asthmatic reflex, there must be some other condition in greater or lesser proportion. It may therefore be asked what the other condition may be, and I think it will be generally accepted that it is something which heightens the sensibility of the vago-accessory centre in the medulla oblongata, producing a condition recognized, with some reservation, as vagotonia.

Dr. Langdon Brown,¹ in his presidential address to the Section of Therapeutics, classifies the possible excitants as psychical stimuli, foreign proteins, and peripheral stimuli. It is in the last group that nasal irritation finds itself, along with eyestrain, hay fever and other nasal troubles, sinus infections, gastric and intestinal disturbances, and uterine disorders. The centre may receive sensory stimuli through the sensory divisions of the fifth and those of the tenth nerve. Through the former are conveyed the stimuli aroused by nasal disorders, and through the latter those from the bronchi, the stomach, and other internal organs; derangements of any of which may excite the asthmatic spasm.

In regard to the psychical element, we all know of the instance of spasm excited by the presence of an artificial rose, which is only a special case of the effect of expectation so strongly emphasized by Hurst.² The existence

of a cortical centre for expiration has been proved by the experiments of Horsley and Semon,³ and there should therefore be no difficulty in explaining the psychical influence which may determine the asthmatic explosion. This centre is closely associated with that for the adduction of the vocal cords and production of voice. In one of my cases in which there was a strong desire to awaken the sympathy of a couple of indulgent parents, and to keep a husband in a state of anxiety, each expiration was accompanied by a vocal sound which was to a great extent voluntary.

Relative hypersensitiveness may be caused indirectly by the removal of cerebral cortical inhibition, and may be supposed to occur in Dixon's experiments, but, as he says, it is doubtful whether it has any significance in the case of the dog. Direct facilitation by a too excitable cortex may produce the same effect, as also may a want of "balance" from defective endocrine action on the sympathetic.

A most important cause of vagotonia is the anaphylactic action of foreign proteins producing undue irritability of the vagal centre. Admitting this to be a frequent factor in the asthmatic condition, it is unlikely that it is the only one or an inevitable one. This part of the subject has been thoroughly dealt with by Coke⁴ in his exhaustive work on asthma. It appears that only 50 per cent. of cases of asthma answer positively to the skin tests for special sensitization. Drs. Knott and Oriol⁵ say that they are not of any clinical value, and Hurst⁶ states definitely that except for food proteins in children and also for pollens, they are unsatisfactory. Dr. Adam,⁷ in his masterly treatise, holds that over-feeding, especially with farinaceous food, is mainly responsible for the disease we are considering, and treatment founded on this hypothesis appears to be eminently successful. Its importance as a cause is indisputable, both as an excitant of a general toxæmia and a peripheral stimulus through the sensory gastric branches of the vagus. McDonagh⁸ says, "Prevent and get rid of familial chronic intestinal intoxication and there would be no asthma." The need for appropriate nasal treatment is at the same time stressed by Adam⁹ and by Coke.¹⁰

While admitting these possibilities, I think there is every reason to attribute a very large share in the

* Read in the Section of Oto-rhino-laryngology at the Annual Meeting of the British Medical Association, Eastbourne, 1931.