The John B. Murphy Oration

[ABRIDGED]

ON

MURPHY, AND SOME PRINCIPLES OF
URINARY SURGERY*

BY

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We are met to commemorate a great surgeon and a great man, one who was recognized throughout the civilized world as the greatest American surgeon of his time, and one whom future generations will undoubtedly place among the greatest surgeons of all time. It seems only fitting, therefore, that at the commencement of each annual clinical congress of the American College of Surgeons, in the foundation of which he took so keen an interest and played so active a part, we should recall in respectful and appreciative remembrance John Benjamin Murphy.

It was my good fortune to meet Murphy on three occasions, the last immediately before the outbreak of the war, when this congress met in London, under his presidency. Well do I recall his commanding presence, his handsome appearance, his tall and erect bearing. Any slight surprise on first hearing him speak, that nature had not endowed him also with a proportionately powerful voice, became rapidly dissipated in the beauty, grandeur, and the consistence of the argument, and the obvious sincerity, enthusiasm, and earnestness of the speaker. Murphy undoubtedly possessed, in a superlative degree, the power of presenting facts and deductions from them in so orderly, concise, and forceful a manner as to convey the profoundest conviction. None who heard could for a moment doubt but that he himself was firmly convinced of the truth of all his statements, and that such belief was not born merely of intuition, but was founded upon prolonged observation of his facts and their careful testing by direct experiment.

It is of necessity, however, by his published writings that posterity will judge him; nor need its verdict be feared. The volumes of his *Surgical Clinics*, published bi-monthly from 1912 until his death, reveal his innermost thoughts on the most varied topics of surgical interest, and many truths are there presented in the form of aphorisms so peculiarly appropriate as to command remembrance. Besides articles in textbooks and year-books of general surgery Murphy published sixty-six papers in medical and surgical journals, all of them substantial additions to surgical knowledge, and many of epoch-making importance; practically everything he originated has become standard practice to-day.

In this era of increasing specialism, it seems almost incredible that, within such recent times, any single individual could have written with such intense originality and authority upon so many and such diverse branches of the surgical art. As W. J. Mayo so aptly phrases it of Murphy—"We must remember the number of targets at which he shot, and that he always rang the bell." Murphy's earlier writings were concerned mainly with abdominal surgery, and it was undoubtedly in connexion with his "button" for intestinal anastomosis that he first became prominently known outside America. Introduced only after many careful experiments upon dogs, it provided surgeons with an easier, quicker, and safer method of anastomosis than any hitherto available. Its supreme value, however, has been as an educational factor—it taught us the essential principles of union

between peritoneal-clad surfaces. Though it is now the almost universal practice to dispense with any form of mechanical device in performing visceral anastomosis, yet it can be truly said that the Murphy button has been the most valuable single educative step in the history of abdominal surgery, and that without it the marvellous progress since achieved would not have been possible.

The closely allied conditions of appendicitis and peritonitis soon attracted Murphy's attention, and I cannot conceive that the essential features in their treatment could be stated more concisely or more accurately than in Murphy's masterly paper on perforative peritonitis. Though his words were written almost a quarter of a century ago, they still represent the truth, the whole truth, and nothing but the truth, in the treatment of acute peritoneal infections, a truth, moreover, which amounts to an almost complete reversal of what was previously considered orthodox. Of all Murphy's contributions to surgical progress, this recognition of the defensive and protective capabilities of the peritoneum, and the principles by which these can be aided and not hampered in their beneficent efforts, constitutes, in my opinion, his supreme achievement. Only those of us who, by length of experience, are able to contrast the results of surgery in peritonitis prior to Murphy's epochal work with those now obtained can realize what an enormous number of lives he has already been the means of saving, and what an immeasurable load of human suffering he has already prevented.

To a remarkable extent Murphy possessed the ability to sift rapidly the essential from the non-essential, and to establish broad basic principles. My predecessors in this Oration have shown how he applied these principles in certain selected spheres of his surgical activity, but only scant reference has yet been made to that of the urinary system. I propose, therefore, to consider some of the principles of urinary surgery, and Murphy's work in relation thereto.

RENAL FUNCTIONAL TESTS

One of the first of these principles, and one which Murphy continually stressed throughout his teaching, is that the state of the renal function as a whole must be thoroughly appreciated before any capital operation is performed upon the kidney or, indeed, upon any part of the urinary tract. It is essential to know beforehand, not only that there is a second kidney actually present, but also that its functional capacity is sufficiently good to carry on life should its fellow require removal. In pre-cystoscopic days it was often quite impossible to obtain this information, and disaster was not infrequent. My old chief and predecessor in the chair of surgery once confessed to me that during his thirty-five years of practice he had on three occasions removed a patient's only working kidney. Such errors, though at that time unavoidable, are quite inexcusable since the advent of the cystoscope and of the many tests of renal function. These have enabled us to measure the functional capacity of the kidneys with an accuracy that is truly remarkable, and which compares very favourably with that obtainable in any other system of the human body.

Of the many tests of renal function that have from time to time been proposed, the surgeon is concerned chiefly with those that, while trustworthy, are yet readily practicable. Of the blood tests, the estimation of the urea-nitrogen, and of the kidney elimination tests, the "urea-concentration" test of MacLean, the indigo-carmin, and the phenolsulphonephthalein tests are those most in favour in England. The last is certainly the best quantitative test, but the indigo-carmin has an exceedingly high qualitative value, and is particularly useful for detecting differences in function between the two kidneys.

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Reliance should never be placed, however, on any single test, and in my wards the blood-urea, urea-concentration, and indigo-carmin tests are used as a routine in all cases.

Though the older method of pyelography, by the introduction of opaque media directly into the renal pelvis through the ureter catheter, yields valuable information of its anatomical shape, size, and situation, yet it gives no evidence of the renal function. Many workers, chiefly in America and Germany, have recently attempted to remedy this defect by introducing a shadow-casting substance into the blood stream, so that, upon excretion in the urine, radiography would reveal the outlines of the pelves and ureters. Sodium iodide in 10 per cent. solution, at first alone and later in combination with urea, uroselectan, abrodil, and uroselectan B, have been tried successively for this purpose. Researches are in progress with compounds of bromine, which are said to be safer and less costly than those of iodine, and, as there is little doubt but that in the near future preparations will be discovered still less toxic and yielding a deeper shadow, this "intravenous" or "excretion" pyelography promises to be of the greatest value to urology; it may, indeed, prove epoch-making. It has the advantage over the older or "retrograde" pyelography that it does not require ureteral catheterization, and can therefore be used where this is difficult or impossible. Moreover, it gives bilateral pyelograms, and avoids the risk, inherent in the "retrograde" method, of conveying infection in septic and tuberculous cases. It must not, however, be regarded as a substitute for, but rather as complementary to, retrograde pyelography, and where the renal function is so defective that the drug is not excreted in sufficient quantity to cast a recognizable shadow, the latter will still be required.

RENAL BACK PRESSURE

Another principle to which Murphy constantly referred, and one, moreover, applicable to systems of the body other than the urinary, is that long-standing pressure upon an organ or system should never be released suddenly, but always gradually. The evil effects of pressure are well known, and if this be brought to bear suddenly upon an organ it may lead to its actual rupture, or, short of that, to damage more or less irreparable. If, however, increasing pressure be applied slowly, so great is the adaptability of the human tissues to altered circumstances that compensatory mechanisms arise which delay its injurious effects. If sudden relief be given, there may follow such a repercussion as even to exceed in its harmful effects the original pressure, whereas gradual alleviation may lead to recovery, the completeness of which will vary inversely with the delay in its application. It can, in fact, be laid down as a general principle that the greater the pressure the more gradual should be its relief.

The best illustration of this is undoubtedly afforded in the treatment of "back pressure" upon the kidneys, such as occurs with a progressively increasing obstruction from the prostate gland. Once the prostate gland commences to impede the urinary stream, from that moment onwards the whole of the urinary tract proximal to the prostate inevitably suffers from the steadily increasing pressure. Since, however, Nature has granted us a fairly generous reserve of renal tissue over and above our actual necessities, clinical manifestations of such pressure may not be apparent until comparatively late. We then meet with the symptoms typical of chronic uraemia, and if the back pressure continues unrelieved, gradually increasing coma supervenes and heralds death.

These back-pressure effects are seen in their most extreme form in those cases of "silent" distension of the bladder, which are not infrequently associated with a small contracted fibrous prostate, or with a small "mid-

lobe" enlargement. Such a patient walks into your consulting room feeling perfectly well and often looking so, complaining only that he "makes too much water," which is the layman's mode of expressing frequent micturition. The bladder is found distended to the level of the umbilicus or beyond, yet without arousing in him the slightest sensation of distension; his urine, which is passed frequently and in very small quantities, is merely the "overflow" from the hugely distended bladder; it is clear, very pale, with a urea content of 0.5 per cent. or less, while his blood urea may be from 100 to 300 mg. per 100 c.cm. of blood, or even higher. He scoffs at the idea that there is anything seriously wrong with him, and yet, notwithstanding, he is on the very brink of uraemia. The immediate cause of his dangerous state is not the actual pathological condition of his prostate gland, but the back-pressure effects it has produced upon his kidneys; hence our first concern is the release of the kidneys from such back pressure rather than the removal of the prostate—that is for future consideration.

This opens up the interesting question as to what should be our main reason, as surgeons, for ever recommending a patient to undergo the operation of prostatectomy, especially if he be only in the early stages of his trouble. The patient's mind is concentrated upon the purely local effects—the difficulty and frequency of micturition—and it is the removal of what he regards rather as nuisances that reconciles him to the radical operation. The surgeon, however, advises prostatectomy for a much stronger reason—namely, as a measure designed primarily to prevent progressive destruction of the kidneys from back pressure. It cannot be too strongly emphasized that a patient with even a slight degree of prostatic obstruction cannot possibly have perfectly healthy kidneys; from the first moment of obstruction the kidneys commence to suffer; prostatic obstruction and healthy kidneys are as incompatible as are heat and cold.

If this renal back pressure be released suddenly, as by completely emptying a chronically distended bladder at one catheterization, then a characteristic sequence of events is frequently observed. The urine next passed spontaneously, or withdrawn by catheter, contains blood, the haemorrhage being of renal rather than of vesical origin. This haematuria may last for two or three days only, or it may continue to the end. The urine steadily diminishes in quantity and deteriorates in quality, the patient becomes increasingly drowsy, and all the signs of uraemia appear within about fourteen days of the first catheterization, coma and death supervening shortly afterwards. It is because of this comparatively long interval of from twelve to fifteen days between the first catheterization and the fatal issue that many practitioners fail to recognize the real causal relationship of the one to the other. I well remember an enthusiastic house-surgeon who, when I entered my wards one morning, proudly greeted me with the information that he had just withdrawn eighty ounces of urine from a case of prostatic obstruction; I recall, also, how his countenance changed from one of pleasure to one of pained and surprised incredulity when I gently hinted that he had possibly also withdrawn the man's last chance of recovery; and how, unfortunately, this proved so, since death from uraemia occurred on the fourteenth day. The risk of catheterization in chronic prostatic obstruction cannot be too strongly emphasized; it constitutes a risk considerably greater than that of many major abdominal operations, and one that should never be undertaken save under appropriate physical and aseptic conditions. The excuse of urgency cannot here be pleaded, as it might possibly be in a case of acute prostatic obstruction, since in chronic obstruction the patient is not in any distress, and is,

indeed, usually quite unaware of the distended state of his bladder.

The various methods of effecting gradual renal decompression need not be referred to in detail; the more gradually and continuously they act the greater their safety. In the most serious instances, however, and especially in those of that "silent" distension of the bladder to which I have already referred, and where instrumentation even of the slightest kind is fraught with danger, decompression should commence with medical rather than with surgical measures—rest in bed, warmth, vapour baths, milk diet, restriction of fluids, diaphoretics, and saline purges. When by these means the fundus of the bladder has been induced gradually to recede below the umbilicus, decompression may be continued with an indwelling catheter connected to the Shaw-Young or other controlling apparatus.

HAEMATURIA

Another important principle in urinary surgery is that haematuria should never be regarded lightly. While haemorrhage from other sources may not necessarily be of serious import—for example, epistaxis, bleeding from haemorrhoids—haematuria is always of weighty significance. Fortunately for the diagnosis of its cause, haematuria is usually accompanied by other symptoms of urinary disorder, which assist in its interpretation. A very interesting group is constituted by those cases where haematuria is absolutely the only symptom of which the patient complains; indeed, many of them volunteer the statement that, had they been blind, and so unable to detect the altered colour of their urine, they would never have known there was anything wrong.

Haematuria of this symptomless type may arise from diverse pathological conditions; in fact, almost any disease of the urinary tract may occasionally so first declare itself, though with most of them this is very exceptional. In 1927, I analysed 200 cases that had come under my own observation, and found that the haemorrhage was of vesical origin in 60 per cent., and of renal origin in 40 per cent. Of the whole series, 50 per cent. were due to benign and 31 per cent. to malignant neoplasm. Of the renal haematurias, 45 per cent. were from malignant neoplasm, while of the vesical haematurias, only 25 per cent. were associated with malignancy.

The term "essential" or "idiopathic" haematuria is sometimes used to indicate renal bleeding of unknown causation, but such a title merely cloaks our ignorance, and is one against which every scientific mind must revolt. Murphy was himself very sceptical of the reality of idiopathic haematuria, and stated that, in his experience, blood in the urine always indicated pathology in the genito-urinary tract. Yet in one of his clinical lectures he referred to a case in which Senator of Berlin had removed a kidney for extreme anaemia from haematuria, and which, on subsequent microscopical examination, failed to reveal any cause for the haemorrhage. The disquieting truth remains, therefore, that a kidney may take upon itself to bleed, and to bleed so furiously as to threaten death from haemorrhage and necessitate nephrectomy for its arrest, and yet subsequent careful macroscopical and microscopical examination by a skilled pathologist may fail to disclose any abnormality whatsoever. I have met with three such cases.

In symptomless haematuria it is only by cystoscopy that the source of the haemorrhage can be determined with certainty, and this should be regarded as a matter of extreme urgency, particularly if bleeding is actually occurring. Murphy constantly insisted upon this point, and yet it still happens much too often that the practitioner's first efforts are directed, not to ascertaining the source of the bleeding, but to its arrest; he puts his patient to bed and administers morphine and internal styptics.

Although this course may allay the alarm which many patients not unnaturally feel at the discovery of blood in their urine, yet it may, in the long run, prove the greatest possible disservice; it is much more advisable to allow the haemorrhage to continue until arrangements can be made for a cystoscopic examination. Cystoscopy is here as urgently called for as is early laparotomy in acute abdominal crises, and if it be postponed until haemorrhage has ceased it will often fail, in renal haematuria, to indicate its source.

When, through the cystoscope, blood has been observed to escape from one ureteric orifice only, a thorough investigation must be instituted by all the urological methods to ascertain the pathological lesion in the corresponding kidney. By them positive evidence may be obtained of certain conditions—for example, calculus, neoplasm, or tuberculosis—but when their findings are entirely negative the interesting question arises whether we are to treat the bleeding expectantly, or whether we should explore the kidney operatively. Those who advocate surgical exploration do so mainly because of the fear that otherwise an early malignant neoplasm might be overlooked. Most American writers favour expectancy, but my own inclination is towards exploratory nephrotomy in these circumstances, and only when this has been undertaken with a negative result do I care to label the haemorrhage as "idiopathic" or "essential." It was by such exploratory nephrotomy that the two earliest malignant renal neoplasms I have ever operated upon were discovered, and both these patients are alive and well eight years and four years respectively after nephrectomy. Should exploratory nephrotomy fail to reveal any macroscopic lesion, a small slice of the parenchyma is removed for microscopical examination, and the kidney carefully sutured. The case is now regarded as one of "idiopathic" haematuria, and should the haemorrhage ever recur it may then be treated expectantly with the confidence that a malignant growth has not been overlooked.

EARLY SYMPTOMS: RENAL TUBERCULOSIS

One of the most characteristic features of Murphy's clinical teaching was the extreme importance he so consistently attached to an accurate account of the early history of the complaint under consideration, and especially to the order of onset of the respective symptoms and signs. Acute appendicitis affords the best example, and Murphy's description of the order of onset of the symptoms of this disease will long remain classic. In the differentiation of renal conditions, Murphy was equally insistent upon the value of the onset symptoms—in renal calculus it is pain that is to be expected, in neoplasm of the kidney it is haematuria, while in renal tuberculosis it is increased frequency of micturition.

The subject of renal tuberculosis had a profound personal interest for Murphy, for in 1883, while a post-graduate student in Vienna, he had a sharp attack of haematuria, which a Viennese professor ascribed to tuberculosis of the right kidney. The haematuria soon ceased and never recurred, nor is there any record of the tubercle bacillus ever having been found, though throughout his life he had slight transitory albuminuria after great exertion or following any special mental strain. At the necropsy upon Murphy, which he himself had requested to be made, his right kidney was found to be extremely small, with extensive cicatricial change; no giant cells were discovered microscopically, and the opinion formed was that the condition represented a chronic persistent infection due, probably, to some organism other than the tubercle bacillus. The cause of death was angina pectoris from atheroma of the coronary arteries, and this was regarded as an infection metastasis from the right kidney. His friend, Dr. W. A. Evans, has expressed the

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 vesicle 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 variously 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.