

MIGRATORY CALCULI.

Lastly, I want to show the possible and actual dangers of leaving a calculus to make its own way out of the urinary passages. In this connexion let me ask what would be thought of a surgeon who advised a patient with a stone in his bladder to wait a few months and see if it would pass through the urethra naturally on the ground that it was only a little stone and therefore would be able to make its way perhaps without, perhaps by dint of, stretching; that the process might be a painful one, or might not; that when once the calculus got into the passage the force of the pressure of urine behind would be almost sure to drive it onwards, but that if it did not do so, or alarming symptoms due either to the over-distension of the organs behind or to the sloughing of the part of the tube in which the calculus was impacted, then, and then only, resort should be had to an operation. This is precisely the line of argument daily acted upon in the case of renal calculus. And why? Not because less damage to the kidney will result from the obstruction in the ureter—on the contrary, the serious effect of a blocked ureter is much earlier and much more rapid in its progress; not because the suffering from renal calculus is less than from vesical calculus; not because extravasation of urine never occurs from obstructed ureter or renal pelvis, for witness the perinephric and periureteral abscesses and fistulae, but because of the supposed risks to life of operation on the kidney. This reason is really no longer tenable. No operation practised for vesical calculus has a lower mortality than nephrolithotomy. For years I made it a practice in cases in which the symptoms were slight and of only recent occurrence to treat the patients for a time on the expectant plan. I have several specimens passed in this way; they are the emblems of what ought to be very largely an obsolete treatment.

Summary.—The conclusions at which I have arrived are the following.

1. That the aim of the surgical treatment of renal calculus should be to extend the application of nephrolithotomy and thereby restrict the necessity of nephrotomy and nephrectomy.
2. That more frequently than not the failure to find a stone is not in reality a failure of treatment, because there are so many curable morbid conditions which mimic renal calculus and which are discoverable only by exploration.
3. That the theory that a stone in one kidney, whether that kidney is itself painful or not, reflects or transmits pain to the opposite kidney, is quite unproven; that it is a dangerous theory calculated to lead to very erroneous practice and that the surgical principle with regard to exploratory operations should be that with pain, paroxysmal or continuous, on one side only the kidney on the painful side should be explored.
4. That nephrectomy for calculous conditions is very rarely called for and should be done only in most exceptional cases. Nephrotomy for calculous pyonephrosis is the proper operation—at any rate as a primary operation—because of the frequency of double calculous disease. Experience has shown that kidneys from which stones weighing 830 gr. and 1300 gr. have been removed are functionally sufficient to maintain life during the blocking of the ureter and the suspension of the function of the kidney of the opposite side.
5. That nephrectomy whilst the opposite organ is occupied by calculus is fraught with very great danger to life; whereas nephrectomy after the opposite kidney has been freed from stone will probably be followed by recovery from the operation and possibly by very good health for years afterwards.
6. That when renal calculus causes reflected or transferred vesical or ovarian pain the removal of the calculus will be followed by complete cure of the bladder or ovarian symptoms.
7. That in some cases renal calculous conditions are attended by very remarkable nervous symptoms, sometimes with sometimes without high temperature, and that information as to the cause of these symptoms is needed.
8. That unsuspected renal calculi are a source of very real danger to their possessors, and when, whether by accident or by the systematic examination of the urine, we have cause to suspect the presence of a calculus we should recommend its immediate removal regardless of the fact that it is not causing renal or transferred pain.

9. That quiescent calculus is as dangerous to the individual as unsuspected calculus and ought to be removed by operation.

10. That the hitherto accepted teaching that a renal calculus, if causing only mild symptoms or attacks of renal colic of only recent occurrence, should be treated on the expectant plan ought to be discarded as unsound in theory and dangerous in practice.

11. That the same principle should be applied to renal calculus which has long been the rule in regard to vesical calculus—namely, when suspected it should be searched for; when known to exist removed, without waiting in the hope that it may become encysted or spontaneously expelled.

12. That the very low mortality of nephrolithotomy puts this operation upon the same footing for renal calculus as lithotripsy in the most experienced hands for vesical calculus.

A SHORT ACCOUNT OF THE MIDDLESBROUGH SMALL-POX EPIDEMIC—1897-98.

By CHARLES V. DINGLE, M.D., B.S., B.HY. DURH.,
MEDICAL OFFICER OF HEALTH FOR MIDDLESBROUGH PRO TEMPORE.

UP to and including March 31st, 1898, there had been 1200 cases of small-pox notified during the epidemic at Middlesbrough. The first case was notified on Nov. 22nd, 1897. The origin of this case is somewhat obscure; it was supposed at the time to have been contracted at a wild beast show which visited Middlesbrough on Nov. 10th and remained two days, but on further inquiry I have been able to elicit the fact that this person and a friend visited the show together on the evening of the 11th; they were both afterwards attacked by small-pox, the case of the friend not being notified. Both say they felt ill on the night they visited the show. In the case which was notified the patient was removed to the hospital with an unmistakeable small-pox rash on Nov. 22nd—i.e., only eleven days after having been at the show. The patient in the case which was not notified was the wife of a coloured sailor and it is more than probable, although it cannot be definitely proved, that the sailor brought the infection into the town, his wife, sister-in-law, and niece, all living in the same house, and the friend already alluded to, who frequently visited the house, being the first persons to be attacked. This man was in constant contact with the sailors of the port and it has transpired that small-pox was raging in Bilbao and other Spanish ports all last year, there having been no less than 418 deaths from small-pox in Bilbao alone during the year. On an average from two to three vessels enter the port of Middlesbrough every day all the year round from Bilbao and neighbouring ports laden with iron ore, which they discharge at the wharfs in Middlesbrough and at the works on the banks of the river Tees. That cases of small-pox have been imported from Bilbao I know. One sailor left his ship at this port on Feb. 8th last year. He was known to have been about the town and on Feb. 16th was admitted into Sunderland Small-pox Hospital with a fully-developed rash of at least a week's duration, showing that he had small-pox at the time he was in this town.

There was also another source by which the infection may have been brought into the town. On Nov. 2nd, 1897, there arrived in Middlesbrough about 800 navvies gathered together from all parts of the country. They were engaged laying down new tram-lines and were working for a period of nearly three months; no cases have been directly traced to them. After Dec. 4th no cases were notified until Dec. 27th, so that it looked as if the first group of cases had been stamped out. On looking for the cause of the second outbreak I found again that one of the first two families to be attacked had been in close contact with the sailors of the port, the child who was attacked having gone amongst the ships and sailors selling small articles. On Dec. 31st a wake was held over the body of an Irish Roman Catholic who lived close to the infected house from which a child had been removed on the 28th. This case was unrecognised until after death, but there is no doubt that the cause of death was small-pox of a very virulent nature. Dozens of people attended this wake and the rapid extension of the outbreak

can be clearly traced as the result of this wholesale infection. On Feb. 6th, 1898, 37 cases were notified and 75 cases on the 8th, being the greatest number notified in any one day during the epidemic. From this date the epidemic has run the usual course, there being periodical recrudescences, in this instance each succeeding outbreak only averaging half the number of cases in the previous one. The epidemic is not ceasing with the suddenness of the Gloucester outbreak, but is, on the other hand, dying a hard death.

Before the epidemic the sanitary authorities of Middlesbrough had a provision of 14 beds and 2 cots for small-pox cases alone. These were in a separate block but within the same grounds as the block for other fever cases. The main block contained 46 beds used for scarlet fever and typhoid fever. There was also another small isolation block. As soon as it was seen that the provision made for small-pox cases was inadequate the sanitary and sanatorium committee ordered a Humphrey's corrugated iron block, capable of providing 20 beds; the erection of this was immediately proceeded with. In the meanwhile 4 tents were obtained and pitched, but owing to the site chosen for them being close to that on which the workmen were engaged in erecting the Humphrey's building it was not found possible to utilise them, the workmen refusing to work on the buildings so long as there were patients in these tents. Up to Feb. 6th it had been found possible to isolate all the cases, but owing to the sudden increase on that day and on the 8th the accommodation was insufficient for all the cases and only the worst, as far as surroundings and severity, could be provided for, the rest remaining at their homes. The work of erecting buildings was pushed on as rapidly as possible and by March 3rd the authorities got so well ahead with their work of providing accommodation that it was possible to once more isolate every case as it occurred and also to take in as many of the cases which had been left in the town as could then be persuaded to be removed. Finally provision was made for 822 beds, the greatest number ever occupied at one time being 578. The blocks of buildings are divided into three sections, facetiously named by the patients, "Dawson City," "Klondyke," and "Kimberley." The first section consists of six of Humphrey's iron buildings on brick foundations, the second section of ten wooden buildings, and the third section of six wooden buildings, all likewise on brick foundations. The permanent hospital and the block originally built for small-pox have been used for administration purposes alone. Besides the above there are a permanent brick-built disinfecting-house containing a steam Washington Lyon's disinfecter, a small temporary dwelling-house built of corrugated iron, in which two resident medical assistants reside as well as a resident clergyman, and properly constructed kitchens, laundries, discharging block, and storehouses, &c.

Statistics.—At present it is not possible to use the whole of the cases for the purpose of statistics, so I have taken the first 1200 cases—that is, all that had been notified up to April 1st. It is possible that there may still be some more deaths to take place amongst these cases, but there cannot be so many as to materially alter the value of the following tables. In 1897 the estimated population of Middlesbrough was 89,246; it is probably now 90,000. At the beginning of the epidemic a vaccination census was taken by the guardians; the enumerated population, that is, those who were found at home at the time the census was being taken, is given at 69,525, or roughly about 20,000 less than the estimated population. Of the above 68,219 were found to have been primarily vaccinated, 1306 were unvaccinated, and 14,163 had been revaccinated at some period or other of their lives. Of children under fourteen years of age 653 were reported to be unvaccinated. As regards primary vaccination this shows Middlesbrough to be a well-vaccinated town, but the same cannot be said regarding its revaccination. It can reasonably be supposed that the 20,000 not enumerated would be vaccinated in about the same proportions as the above. There are said to be nearly 40,000 children attending the various schools of the district. Taking the 1200 cases attacked, we find they are divided into 1028 who are vaccinated and 172 who are unvaccinated. It is not strictly accurate to work from the enumerated population given by the guardians, so I will take the percentages from the estimated population of nearly 90,000. If these, as I have stated above is most probable, are vaccinated in the same proportion as the enumerated population we have 87,844 vaccinated and 1682 unvaccinated persons in

Middlesbrough.¹ We now see that the attack-rate, 172 cases, amongst the unvaccinated is equal to 10·2 per cent. of the population, whereas the attack-rate, 1028, amongst the vaccinated is only equal to 1·1 per cent. of the total population.

I will next give the fatality-rate for cases attacked. Up to the present time there have been 166 deaths amongst the 1200 cases, that is, 13·8 per cent. of the cases. This is not the death-rate for the whole epidemic, but only represents that for a definite period; nevertheless, as it is not likely that there will now be any more deaths occurring in this group of cases it gives a very accurate knowledge of the proportion of deaths between vaccinated and unvaccinated cases. Of the 166 deaths 79 occurred amongst the unvaccinated cases or cases of doubtful vaccination—that is, cases which are said to have been vaccinated but on whom no marks of the vaccination are visible. This is equal to a fatality-rate of 45·93 per cent. as compared with 87 deaths amongst the vaccinated persons attacked, equal to a fatality-rate of 8·46 per cent. The following table gives the age periods of all the cases, also for the vaccinated and unvaccinated, separately, together with the deaths in each of the latter.

Age periods.	Total cases.	Vaccinated.	Died.	Unvaccinated.	Died.
Under 5 years	29	9	1	20	10
5 years and under 10 years ...	65	32	0	33	14
10 " " 15 " ...	117	99	2	18	3
15 " " 25 " ...	409	384	19	25	13
25 " " 60 " ...	574	501	64	73	38
60 years and over	6	3	1	3	1
Totals	1200	1028	87	172	79

An examination of this table shows the protection afforded by vaccination to life at all age periods. Taking the children under ten years of age we find 94 cases; of these 41 were vaccinated and 53 were unvaccinated, but when we look at the death column we find that out of the 41 vaccinated children only 1 died, whereas of the unvaccinated 24 died.

The following table refers to the revaccinated cases. Out of 1200 cases 56 had been revaccinated at one period or another of their lives. I give the age periods of these cases and the date of revaccination in days before the attack. Of these one died, revaccinated 13 years ago, aged thirty years. Up to March 31st this was the only death in a re-vaccinated person:—

Age periods.	Number of days revaccinated before attack.														Total number
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Under 5 years	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1*
5 years and under 10 } years	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—
10 years and under 15 } years	—	—	—	1	1	—	—	—	—	—	2	—	1	1	2†
15 years and under 25 } years	—	—	—	—	1	1	1	2	3	4	2	2	—	1	3‡
25 years and under 60 } years	2	—	—	1	—	2	2	1	2	2	1	1	2	3	6§
60 and over	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—
Totals	2	—	—	2	2	3	3	3	5	6	6	3	4	5	12

* One 28 days before. † One 28 days and one 7 weeks before.
‡ One 18 days, one 25 days, and one 9 weeks before.
§ Five over 10 years and one 22 days before.

The next table gives a list with age periods of cases attacked with small-pox during primary vaccination with the length in days that they have been vaccinated. Of these

¹ I have based this on 20,000 added to the enumerated population given by the guardians in order to bring the population up to or near its estimated number.

one died at the age of five years who had been vaccinated 12 days.

Age periods.	Number of days vaccinated before attack.														Total number of cases.	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Over 14 days.
Under 5 years	—	—	—	—	—	—	1	—	—	—	1	1	—	—	—	3
years and under 10 } years	—	—	—	—	—	1	2	1	—	1	1	—	1	1	—	8
0 years and under 15 } years	—	—	—	—	—	1	—	1	1	—	—	—	1	—	—	4
15 years and under 25 } years	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1*	2
25 years and under 60 } years	—	1	—	—	—	—	—	—	1	1	1	2	—	2	2†	10
Totals... ..	—	1	—	—	1	2	3	2	2	2	3	3	2	3	3	27

* One 6 weeks before. † One 19 days and one 41 days before.

The following means have been taken for dealing with the epidemic. I have already given a short account of the accommodation provided at the sanatorium. The difficulty experienced was not that the authorities did not fully realise their position; it arose from the impossibility to procure sufficient workmen. The duty of seeing to the erection of the temporary hospitals was in the hands of a sub-committee and when the report of their work comes to be published it will be seen that they carried out their duties to the smallest detail in a manner very rarely, if ever, accomplished before. Not only is there a perfect system of drainage to each ward, but also systems of hot and cold water and gas are laid on. The wards are bright and cheerful, being decorated internally with plants and pictures. The food is excellent, well cooked, and plentiful, and I have heard nothing but praise from all the patients who have been discharged as cured. Isolation has been very efficiently carried out; of the 1200 cases 1078 have been removed to the hospital and treated there. Disinfection by means of SO² cylinders of the infected houses was performed as soon as ever the patient was removed. The bedding and clothes of the patients were removed with them and passed through a Washington Lyon's disinfecter. Mattresses and beds were also passed through the disinfecter, but in many cases, if dirty, were destroyed by burning.

Vaccination has been carried out in various ways; two public stations were opened at which the public vaccinator and his assistants were present all day to vaccinate any presenting themselves free of cost. When the numbers attending these stations began to decline domiciliary vaccination was undertaken by the guardians; the town was divided into twelve districts, and each district was canvassed by a medical man attended by a clerk. Since then the corporation have provided free lymph to the medical men of the town and anyone wishing to be vaccinated can be attended to by their own medical attendant free of charge, the medical man being paid by the guardians for every successful vaccination. Every infected house is also visited and vaccination offered to the inmates.

Middlesbrough.

CLINICAL REMARKS ON STRICTURE OF THE URETHRA.

By REGINALD HARRISON, F.R.C.S. ENG.,
SURGEON TO ST. PETER'S HOSPITAL.

THE following classification of strictures is one which may be conveniently used for clinical purposes. First, those amenable to some form of dilatation; second, those found to be unadapted for such treatment and where other measures should be considered; and third, those which may have been regarded as impassable strictures. I shall limit my remarks to questions arising under these three headings.

The first class includes by far the greatest number and all strictures in their early stages. When this process of treatment proceeds satisfactorily, as it usually does, the

patient is soon able to undertake the management of his own case after he has been instructed in the use of the appropriate instrument. For whatever is done in the way of treatment by dilatation or otherwise in the majority of advanced forms of urethral obstruction the patient can seldom hope to entirely dispense with the passing of a bougie. When a person who is suffering from symptoms which may indicate stricture presents himself for the first time, much care is required in exploring his urethra with a catheter or bougie. It is very easy to spoil a stricture and so lose the way through it. Thus future access to the bladder may be rendered rather more than less difficult. On making an examination of this kind our object should be to ascertain, without causing pain or bleeding if possible, (1) the presence and position of the obstruction, and (2) the degree of contraction which has been arrived at. It is undesirable to endeavour to pass an instrument into the bladder without knowing all this beforehand, otherwise we may easily select one too large for the purpose and so in the first attempt do more harm than good. The thinnest end of the wedge must first be inserted and then the dimensions of the contraction can be readily and accurately gauged. In view of giving effect to these points I described fifteen years ago¹ a flexible conical bougie or dilator which, so far as my experience of it goes, has superseded most instruments of this kind and has been the means of considerably reducing the number of what are called impassable strictures. These instruments are used both for locating and measuring all kinds and degrees of urethral stricture. They are about 20 in. long, commencing with a fine probe-ended extremity, which gradually expands in the opposite direction. They are made in different sizes and are rendered extremely flexible when placed in warm water for a few minutes if necessary before using them. In this way they will readily coil up within the bladder. I much prefer the French make (Lassère's); I find them useful, not only for the purposes I have mentioned, but for smoothing out a rough urethra and making the access to a stricture funnel-shaped so that it may be easily entered by almost any other instrument. The late Mr. Lund of Manchester christened them "whips" when I first showed them and he adopted them, and they have since always gone by this name. Bangs' filiform bougies, made on the same principle of the finest whalebone, are applicable to even more contracted forms of obstruction, such, for instance, as the eccentric pin-hole strictures which are occasionally met with. They may also often be used with advantage as pilots for the "whips." I can strongly recommend both of these instruments to practitioners who are liable to meet with stricture cases and have not hitherto given them a trial. Either of them will do duty in an emergency in relieving a retention of urine in the absence of a catheter by at once dilating the stricture to almost any extent by a single introduction of the instrument. On its withdrawal the patient is usually able to empty his bladder immediately by his own efforts. I have frequently used them in this way with prompt relief. I think they should be more generally known. No force can be exercised by them, otherwise they will double up and the object be defeated.

Passing to the second class of cases, which includes strictures found on trial to be unadapted for any form of dilatation, when for any reason a large amount of scar tissue has been imported into a stricture—as, for instance, in obstructions following wounds and injuries of the urethra—it may be found impossible to sufficiently dilate the contraction which follows. This may proceed from some difficulty in connexion with the access or entrance to the stricture, as when damage has been done to the interior of the urethra, from the inherent contractility of the tissue composing the obstruction, or from certain constitutional disturbances following attempts at dilatation even of the gentlest and most gradual kind. Let me briefly illustrate these three conditions.

CASE 1.—A man, aged forty-two years, saw me in 1890 under the following circumstances. He was a great traveller, and though he had a slight stricture for which he occasionally used a bougie himself he was not inconvenienced by it. About a year before I saw him he had had sudden retention of urine following a chill when he was in a remote part of Australia and there had been much difficulty and bleeding in relieving him with a metal catheter. Since this happened he had never felt certain whether he would be able to pass his bougie. Sometimes it would enter and at others it

¹ THE LANCET, Feb. 3rd, 1883.