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Urinary Calculi

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On Urinary Calculus.

In treating of this subject I have divided my Thesis into four heads

1st The history of calculous disorders & of their treatment.

2d Their nature & causes

3rd The different kinds of calculi with the diatheses on which they depend &

4th The different modes of treatment

I have then made a few remarks on the circumstances affecting the development of the disorder as to age. sex & occupation.

Le Clerc. Histoire de la Medicine
Par. 1re Liv. III Cap. XXVIII

A. Corn. Celsus de Medicina lib. VIJ.
Cap. XXVI 3

Op. citat. lib. VII. Cap. XXVI. 1

First then with regard to the history of the stone

The first mention which I can find of our subject refers to the operation of lithotomy - It is that Hippocrates who flourished in the eighth Olympiad about the time of the Peloponesian war made his disciples take a vow that they would never cut for stone. but would leave it to those who made a particular profession of it. After him came Ammonius of the Alexandrian school called by Celsus "the lithotomist," one of the first who recommended lithotripsy when the stone was too large to be removed by incision.

Celsus who is generally supposed to have been born in the reign of Augustus, but to have written in that of Tiberius gives a minute description of the operation - He makes mention of the possibility of the stone being expelled by the urethra, especially if it have been distended by a catheter; the withdrawal of which

Op. cit. lib VII Cap. XXVI. 1.

Le Clerc - op. cit. Par 2de Liv II Cap. III
P 657

Le Clerc. Essai d'un plan pour servir a la
Continuation de l'histoire de la medecine
Freind History of Physick. vol I. p. 4

it sometimes follows. and describes a method of cutting into the urethra if the stone should have stopped in it.

He limits the age for the operation of lithotomy to between the ninth and fourteenth years.

Rufus the Ephesian who lived under the Emperor Trajan has left us a work upon the disease of the kidneys and bladder which however is said by Le Clerc to contain nothing particular.

Actius of Amida in Mesopotamia is the first mentioned as having attempted to dissolve urinary Calculi by the administration of internal remedies and is placed by Le Clerc in the fourth century but Friend makes him about a century later.

Alexander of Tralles a city of Lydia who lived about the same time as Actius is said to have been skilful in the diagnosis

Freud Op. cit.

Freud Op. cit. Vol I p. 162

Freud Op. cit. Vol I. p. 245

of many diseases amongst others of stone — He is however accused of practising magic in the cure of ". Agnes Stone colick and gout. He is said to have insisted on bleeding in a case of the stone.

Paulus surnamed Aegineta from his birthplace the island of Aegina was of the same school. He differed from others in the age suitable for the operation of lithotomy as he extended it to those of middle years or even of advanced ~~age~~. He also recommended the operation to be made a little to the left of the median line and not in the raphe as formerly. The internal incision he says must be no larger than to admit of the passage of the stone, but the external must be larger

Palladius observes (I quote from a friend) " that the stone increased much in his time and

Miller's principles of Surgery (Introduction)

Freind Op. cit Vol ii p. 179

was less curable and this he imputes to the luxury of the age to much eating and to want of exercise, thus showing that he had a pretty accurate idea of the nature of and causes of Stone

We have a blank here in the history of lithotomy, as we turn from the Greek writers to the Arabians: lithotomy then was neglected by the regular profession and had fallen into the hands of ignorant impostors.

Albucacius the pupil of Avicenna lived about the end of the eleventh century. He is the Bulcasim of Le Clerc He seems to have been a good operator and is particular in describing the method of operating upon women

In his time however the operation was generally performed on that sex by a Wife-wife who followed the surgeon's

instructions) — I quote again from Friend "The directions he gives is to introduce the finger into the Pudendum and by pressing upon the bladder with the left hand to bring the stone down as low as possible from the orifice of the bladder to the root or bottom of the Os Coxae and there where ever the stone is felt to make an incision which at first should be but small after this a radius is to be introduced and if the stone is then felt the incision is to be enlarged to the bigness thereof,

By his description the place of section seems to be lower than where Celsus orders it which is "inter urinae iter et os pubis" beginning probably from within the vagina — — — — — — — — — — — — — — The place of section here pointed out by Albucasis is exactly the same where Frère Jacques and after him M^r Rau chose to cut. though I do not believe that either of them learnt

Freind Op. cit. Vol II p. 92 & 101

Rosa Anglica p. 97

* Anderman Englishman of the same century gives some receipts for allaying the heat of urine caused by stone

Freind Op cit.

this way of cutting from this author.

Arcuzoar - who lived in the twelfth century talks of lithotomy as among the "Filthy and abominable operations of surgery unfit for man of character to perform"

He also speaks of the virtues of an "Oyl called Algniscemi a most miraculous lithriptic which his father brought out of the East."

In the fourteenth century we have John of Gaddesden who also attempted the Solution of the stone *

In the middle of the fifteenth century lithotomy was taken from the hands of quacks and impostors and restored to the regular profession by Germain Colot a French surgeon

In 1521 Marianus Sanctus published a description of the operation by cutting down upon a staff. This he was taught by Johannes de Romanis a Cremonese

Frère Jacques or Frère Jean de St. Cosme invented the lateral

section as now practised. He was followed and improved upon by Professor Van of Leyden

But it was not until the end of the eighteenth and beginning of the present century that calculous disorders and their treatment became fully known

In no field of our art have there been more and abler inquirers —

Chemistry by setting ~~by setting~~ before us the nature of the urine and the composition of the calculi. Physiology by explaining the functions of the stomach kidneys and skin with their intimate relation to one another ——

The Microscope by giving us a means of distinguishing between the kinds of deposits. Have all taught us the ready diagnosis and the rational treatment and left us little more to be desired

Were I to enumerate the different labourers in this field since the middle of last century I should only weary

Many

Many of their writings you are doubtless acquainted with — Douglass and Cheselden — Heurteloup and Civiale — Crosse & Brodie — Weiss & Bence — Jones — Prout & Golding — Bird —

Nature of Urinary Calculi

Healthy urine contains a number of substances held in solution by water of these the principal are — Urea and Uric acid with Sulphates of the Alkalies Phosphates of the Alkaline earths and Chlorides of Sodium & Potassium —

These are held in solution in the slightly acid urine of health but if there should be an excess of free acid present or if the urine should lose its acidity and become alkaline or if as more rarely happens there should be an excess of salts then insoluble compounds are formed which are precipitated in the form of crystalline or amorphous granules

These may be passed off as gravel being mechanically mixed with the urine and carried out with it, but they often remain in the bladder and if there should be present any body which may form a nucleus such as inspissated mucus pelvine or a

few of these granules united to each other these crystals or amorphous granules suspended in the urine separate from it and adhere to the nucleus so as to form a calculus which of course goes on increasing in size if the cause the depraved state of the urinary system be kept up.

The presence of any foreign body in the bladder tends to keep up this deranged state by irritating the lining membrane of the bladder and so also of the ureters and kidneys.

The layers surrounding the nucleus are often the result of this irritation and thence it follows that the nucleus is the most important part of the calculus and unless we have its characters fully determined we cannot treat satisfactorily for the primary disorder of these organs

Any impediment to the passage of the urine such as a saccculated state of the wall of the bladder enlarged prostate or stricture of the

urethra favours the deposition of calculous matter from the urine and prevents the escape of the smaller concretions per urethram

Calculi generally increase in size by the addition of the matter of which they are composed in concentric layers which are generally circular, but sometimes and in some concretions are more or less irregular and angular - sometimes a calculus receives a sudden increase in size by the union of one or more other calculi which had coexisted with it, - in this case nuclei correspond with the calculi.

Calculi are of different shapes their form being modified by circumstances. They are generally round and more or less rough externally if there be one only in the bladders, - if more than one, they may become smooth by constant attrition and sometimes

Crosse on Urinary Calculi

small portions become detached by the force with which they impinge on each other.—

As the increase of the size of the calculus is always in proportion to the freedom of access which the urine has to it, we find that those calculi which are fixed or adherent to the walls of the bladder grow more on the free side than on the other so as to have the nucleus eccentric.

Calculi are said to be "fixed" when they are wedged in a sacculus of the bladder, or are caught between its muscular fibres "adherent" when they are actually attached to its walls, which according to Mr Crosse very seldom happens.

The different kinds of calculi present very different degrees of hardness.— the phosphates are generally the softest, the oxalates the hardest.—

The

The rapidity of increase is in inverse proportion to the degree of primness, the phosphates increasing most rapidly and the oxalates more slowly.

There are often deposits in the urine of healthy persons without any serious derangement of the urinary system.

So many when labouring under an attack of cold or after excessive indulgence in eating or drinking, this instead of being a morbid action is only an effort of nature to get rid of what should have been eliminated by the skin or other ~~emunctories~~ during the attack of cold and of what should never have got into the system in the other case.

The different kinds of calculi

There are fourteen kinds mention-
-ed by authors. Lithic Acid —
Lithate of Ammonia — Lithate of
Soda. — Phosphate of Lime — Triple
Phosphate (properly double) of Ammonia and
Magnesia — The fusible calculus
— Oxalate of Lime — Carbonate of
Lime — Cystine or Cystic Oxide
— Uric Oxide — Fibrine Silica and
Alternating Calculus

Several of these are very rare
and it will suffice us to confine
our attention to the Lithates —
Phosphates and Oxalates —

The peculiar state of the system
on which the deposition of the
first of these depends or is sup-
-posed to depend is called the
Lithic Diathesis that on which
the second depends the Phosphatic
and the third — the Oxalic —

The calculus depending
on the presence of the Lithic

Diathesis is usually composed either of Lithic Acid or of Lithate of Ammonia

The lithic acid or as it is often called the uric acid calculus generally is about the size of a large marble ovoid and consisting of a number of well marked concentric lamina the outer of which is either smooth or slightly nodulated and of a reddish-brown colour.

It is distinguished from the oxalate of lime calculus and earthy phosphates by being decomposed and entirely dissipated by heat and from the cystic oxide calculus or fibrine by its leaving a crimson residue when dissolved in hot nitric acid and evaporated to dryness. It has now only to be distinguished from the lithate of Ammonia which has these chemical characters

in common with it. This is done by dissolving the calculus in a solution of Potash by the aid of heat when the odour of Ammonia is perceived coming off should it be the urate of Ammonia but no odour whatever if it be uric acid—

The Lithate or urate of Ammonia calculus often occurs pure more often however it is found alternating with Lithic Acid or some other deposit.

When it occurs pure it forms a stone of smaller size than the uric — more compressed in shape — generally smoother and paler (café' au lait colour) and with less sharply defined laminae

Its chemical characters have already been given

Calculi dependant on the phosphatic diathesis consist

of the earthy phosphates).

Phosphate of lime forms a smooth fawn coloured calculus consisting of a number of regular concentric layers. — It is not decomposed by heat and so is distinguished from the lithic deposits and the other — prise known from the oxalate of lime calculus by the remarkable facility with which it dissolves even in dilute Nitric acid. — To distinguish it from the triple phosphates we add to the solution in acids an excess of Ammonia a precipitate is thrown down which if it be phosphate of lime is amorphous when examined with the microscope — if the triple phosphates — crystalline

The triple phosphates or phosphates of Ammonia and Magnesia are generally

found in combination rarely they exist pure — They form a whitish or stone coloured calculus with a rough and uneven surface often coated with minute brilliant crystals. —

It dissolves readily in dilute acids — to a small extent in hot water but is quite insoluble in cold when heated Ammonia is given off but the calculus undergoes no further change

Fusible calculus which is composed of about two parts of the triple phosphates to one of phosphate of lime is next to Lithic acid the most common component of calculus — existing alone and in combination

It is distinguished by its easy fusibility without being destroyed by heat.

The Oxalic Diathesis

Oxalate of Lime or Mulberry Calculus is also very common — It forms a dark brown rough stone of variable size while its section displays a nucleus generally of lithic acid or lithate of ammonia surrounded by angular zigzag concentric layers. — When heated the oxalic acid taking up oxygen is converted into carbonic acid and driven off — and quick lime left.

This calculus is insoluble in the weaker acids and Alkalis.

I have thus given a hasty and imperfect description of the chemistry of the principal calculi and shall now proceed to describe the symptoms of their presence with distinguishing marks of the different diatheses.

The symptoms of a stone in the bladder are frequent micturition with pain often intense

and referred more particularly to the extremity of the penis — especially severe after emptying the bladder —

Sudden stoppage to the flow of urine which is sometimes tinged with blood and generally contains an increased amount of mucus —

There is generally more or less irritation and pain in the bladder pretty constant & increased by exercise especially by walking down a hill or down stairs or by any jolting or sudden movement &c.

The amount of irritation depends more on the character of the urinary derangement than on the form of the calculus and is greatest in the phosphatic diathesis and least in the oxalic in which from the rough surface of the stone we should

expect most

The evidence to be derived from these symptoms is of course confirmed if we can trace the presence of any diathesis and especially if by the introduction of a sound we can detect the presence of a stone.

There are however sources of deception as regards this last as tumours of the bladder Polypi or enlarged rugae of its coats incrusted perhaps with calculous deposits for an example — see Cope on Urinary Calculus Chap VII.

Urinary calculi when formed may be removed in three ways: —

1. By the urethra
2. By Lithotripsy or lithotrity if too large to pass through that canal 3. By lithotomy — some have attempted a fourth

way viz— by dissolving the stone either by medicines administered by the mouth or by solvents injected into the bladder

Before going on to consider these different modes of radical treatment.— let us look at the means to be employed to prevent the formation if possible or to retard the growth of these calculi.—

Before being able to treat satisfactorily for the stone, itself we must of course discover the diathesis on which its presence depends—

I shall first consider the signs of these—

The lithic diathesis generally occurs in persons of full habit and florid complexion, of indolent and luxurious habits especially if this be combined with any hereditary tendency

to the gouty or rheumatic diathesis

It is accompanied by acidity of the stomach high coloured urine depositing a brick red sediment hence called "lateritious"

The urine is more acid than usual and generally rather scanty and of higher specific gravity than usual.

On examination by the microscope the deposit is found to present either an amorphous or a crystalline appearance the former is owing to the presence of Lithate of Ammonia the latter to that of uric Acid These deposits are soluble in alkalies—

Their presence however is rather an indication of the existence of free acid than a proof that urate of Ammonia is present in excess.—

The phosphatic diathesis on the other hand is characterized

Cystine is triple phosphate

by a pale enfeebled state of the system — enfeebled either by exhausting mental anxiety by bodily labour or by continued dissipation

It is accompanied by a disordered state of the digestive system and nervous irritability

The urine is found to be alkaline from excess of volatile or of a fixed alkali — If it be owing to the latter the deposit which is present is phosphate of lime which either settles at the bottom as a white sand or floats in a thin pellicle on the surface —

On examining this deposit by the microscope we find amorphous granules of phosphate of lime with some of the octahedral crystals of Oxalate of lime —

The urine which is voided

with this deposit is generally pale-muddy — of low specific gravity and secreted in abundance —

It has a disagreeable smell quite unlike that of healthy urine which has been compared by some to the odour of weak broth. —

The blue tinge which this urine gives to reddened litmus paper is permanent.

If again the alkalinity of the urine be owing to a volatile alkali generally carbonate of ammonia — we find that the de-posit consists of the triple phos-phate of magnesia & ammonia —

The urine is pale sometimes coloured pit contains when ex-amined by the microscope prismatic crystals of triple phosphates and some pus-cells — sometimes as in the other case these crystals besides being deposited at the bottom of the vessel

form a thin lamina on the top of the fluid. This urine has a strong ammoniacal smell and turns reddened litmus paper blue — but this change in colour is only temporary passing off as the paper dries and as the Ammonia which caused it evaporates).

The formation of both of these deposits results from a diseased state of the mucous membrane of the bladder depending on local disease in the kidneys or bladder and often on disease of the spinal cord) —

The manner in which the triple phosphate is formed is this.)

Phosphate of magnesia exists dissolved in healthy urine — by the depraved state of the mucous secretion the urea of the urine undergoes decomposition and its ammonia uniting with

the phosphate of Magnesia forms the triple phosphate which is insolu-ble—

The Oxalic Diathesis—

We generally find those suffering from this form of the disease irritable and dejected troubled with dyspepsia and flatulence and sometimes covered with cutaneous eruptions boils or carbuncles "The skin" according to Dr Prout is apt to assume an unnatural appearance difficult to describe but the colour of which may be said to vary from dull greenish yellow in the sanguine to dark olive or livid in the melancholic temperament." These patients are fond of vegetables and of sweets. The urine nearly normal in specific gravity is of a pale or light reddish tint and contains crystals of an octahedral form (oxalate of lime) with some epithelial cells— These crystals

are soluble in mineral acids but insoluble in vegetable acids or alkalies: There are also in some forms of this diathesis crystals of a dinner bell shape met with - these present nearly the same chemical reactions as the octahedral crystals but are commonly considered to be somewhat different in nature The name Oxalate of lime is applied to the substance of which they are believed to be composed

Let us now consider the treatment to be followed when we have ascertained the nature of the diathesis

Grosse says. "The great and prevailing source of Urinary calculi is dyspepsia". This causes an undue secretion of acid in the stomach during digestion & for some time after it The acid this secretes is absorbed & a considerable quantity of it passing into the urine renders it highly acid - The condition called dyspepsia however is not only due to many causes but is of various kinds which differ from each other perhaps as much as the urinary diatheses themselves differ

According therefore to the nature of the dyspepsia the case must be treated: but it is not possible

in all cases to trace the formation of calculi to mere dyspepsia unless that word be applied in a far more extended sense than has hitherto been the custom Some have supposed that Uric acid when produced in excess is able to give rise to the formation of both phosphates & oxalates although the mischief caused by excess of Uric acid is perhaps overrated there is no doubt that it is able to cause inflammation very chronic of course of the urinary mucous membrane & thus give rise to alkalinity of the urine which may result in the deposit of phosphates — The Uric acid diathesis requires alkaline treatment with the administration of tonics & a diminished use of the highly azotised & carbonized articles of diet which are so apt to occasion the red sand deposit — It is always of importance however to change quality of the food (in this case) very gradually for the patient is not able to bear a sudden diminution in the quantity of food and stimulants to which he has been accustomed Distilled spirits should be substituted for fermented drinks — The patient should have more exercise & less mental labour if sedentary & studious habits — At the same time bicarbonate of potash should be given with some agreeable bitter Uric infusion — the bicarbonate being greatly preferable to the carbonate & to the dyna potassae on account of its comparatively pleasant taste its perfect efficiency as an antacid & its entire freedom from any tendency to over neutralise the urine — Soda salts must on no account be given from their tendency to the formation of insoluble Urate of Soda

Where we find an hereditary tendency to Calculus disease we must warn the possessor of it not to aggravate it by a careless and improper mode of living — Much may be done to prevent the development of the disease by removing those circumstances which favour it — Many of those cases which seem to be owing to an acquired tendency as in the children of poor patients (to all appearance free from the disease) who have become wealthy and able to indulge in all luxurious and indolent life — many of these cases I say — are owing to a hereditary taint transmitted through the parents but owing to the circumstances of their life not developed in them. —

With regard to the Phosphatic diathesis again which depends on

on too great alkalinity of the urine dependent in its turn on a depressed and debilitated state of the system — we must administer the dilute mineral acids and advise a generous diet with tonics and relaxation from all harassing mental and bodily exertion —

Opium is said to be beneficial here as it not only gives acid properties to the urine but also tends to allay the nervous irritability As there is often acidity of the stomach in the phosphatic diathesis it would be well to give Bicarbonate of Potash if necessary as an ant- acid for contrary to what may be supposed this salt has no tendency to render the urine alkaline perhaps rather the reverse —

The Oxalic Diathesis again which however it may

have originated depends on the imperfect oxidation of Carbon whether derived from the tissues or absorbed as saccharine matter from the blood, is to be treated by an entire abstinence from all that would generate Oxalic acid in the stomach such as sugar, fermented liquors and vegetables, especially rhubarb and sorrel, we may also administer nitric or nitro-hydrochloric acid and tonics and as in the last case advise change of scene and air with relaxation from toil and cheerful society

The patients diet must be light & nutritious: bread two days old tender beef steak broiled & brandy and water represent the kind of diet the patient should have

We come now to the removal of the Stone from the bladder when once formed there—

I have proposed and attempted to dissolve the lithic deposits by the administration of Alkalies by the mouth.

The preparations they have used are the Carbonate of Potash and Soda — in imitation of the waters of Vichy. This plan may be beneficial in delaying or preventing any tendency to their formation — but once formed the prospect of their solution is so distant and uncertain that few I think labouring under the painful and urgent symptoms of stone would be willing to trust to it —

In the phosphatic diathesis solution of alkalies if at all strong would be hurtful weak solutions are said to diminish the size of the calculus by dissolving the animal matter which causes bits particles to adhere — this also is too uncertain Benefit may be derived however from the mineral acids diluted, by improving the tone of the system especially of the urinary organs.

Injections by the bladder brought to play upon the stone by suitable instruments have been recommended —

Carbonate of Lithia for uric concretions Salts of lead for the phosphatic Oxalate of lime Calculi cannot be affected by any injections or by any remedies administered internally — Doctor Bence Jones has proposed the disorganization of the stone by allowing the galvanic current to act upon it for some time —

The great difficulty which has yet to be overcome is to find a means of applying the current to the stone —

II. Its removal by urethra

A stone which has just passed through the ureter ought to be sufficiently small to enable it to pass through the urethra so that if we get the case sufficiently early we may be able to relieve the patient without his incurring the risks of the operations either of lithotrity or lithotomy.

We can detect a small stone by the sharp click which the sound makes upon it by the small portion of its surface felt by the instrument and by the case by which it is moved about.

By gradually dilating the urethra with bougies & get it accustomed to the presence of a foreign body — at the same time we induce the patient to endeavour to retain his water

for as long a period as possible—

A full sized bougie is then introduced into the passage and left there for some hours (the patient in the mean time retaining his water) on withdrawing the instrument the stone is often carried into the urethra by the gush of urine which follows and thence expelled or if it should remain wedged in may be cut down upon & removed.

That portion of the canal where it is most likely to remain is the membranous—

A plan has been proposed and an instrument invented for the purpose of seizing the stone when of small size and withdrawing it by the Urethra—

The objections are—
The difficulty of laying hold of the stone and the chance

of it's slipping from the instrument or becoming locked with it in the urethra —

III Lithotripsy. or the breaking up of the stone in the bladder with a view to it's being carried off with the urine —

This was an object much desired by the ancients who dreaded lithotomy very much as it was generally attended with fatal results from their ignorance of the anatomy of these parts —

They performed (lithotripsy) with rude and clumsy instruments and with but indifferent success

In modern times the French surgeons seem to have given most attention to this subject amongst others Heurteloup and Civiale have written ably in it's defence and have described instruments to be used for it's performance. —

Civiale de la Lithotritie

The great objections to this operation are the difficulty of catching the stone, the chance of injuring the bladder by enclosing its folds between the jaws of the instrument and the danger of leaving fragments behind to irritate the bladder and to serve as nucleii for other concretions.

The first two objections according to Civiale may be overcome by practice and care on the part of the operator who must turn the instrument over before crushing to see if the bladder be free — for the last I can find no satisfactory answer

There is also an objection which has been urged viz: that the instrument may break in the bladder and so make it necessary to operate not only for the stone but also for the broken instrument

To this it is replied that

no man would think of operating without having previously tested the quality and capabilities of his instrument and as the objection is urged with special reference to the operation as performed before puberty Civiale says that he has operated with an instrument two lines in diameter and if you can get the child to complain at the commencement of the attack before the stone has attained a size which is out of proportion to the diameter of the urethra you have every probability of a favourable result

This operation is however less generally successful in children than in adults but as the chances of success in lithotomy are just the reverse it is not so much to be deplored

On account then of the uncertainty

of effecting a complete cure by this method of the tedious nature of the operation (for in most of those cases mentioned by M Civiale 5-6 or more sittings were required at the interval of one or two weeks) of the exhaustion which such a long course of treatment necessitated of the chance of injuring the lining membrane of the bladder by the broken fragments and so predisposing to a relapse the general adoption of this operation is very unlikely—

I must say however with regard to the exhaustion produced by the frequent repetition of the operation that I am led to mention it more from my supposing it likely to happen than from any facts which I can find recorded— Probably I am wrong for M Civiale's

Baron Heurteloup Principles
of Lithotrity –

talks of his patients as bearing each succeeding operation with more firmness and calmness than the last and states that one returned to his ordinary labours immediately after having been operated upon

Dr Heurtelloup too mentions many cases in which the patients were able to walk some miles from the scene of operation to their homes and one even is mentioned who indulged contrary to Dr. Heurtelloup's advice, in horse exercise between the "seances".—

In with regard to the uncertainty of removing the entire fragments which I have mentioned before as a great objection all his cases as well as those of Civiale are said to have recovered completely and to have had no return of the symptoms up to the date of publication— There is

however no date affixed to the cases themselves so that I cannot say how long the patient had been free.

I am wrong in saying that none of the cases had a recurrence of the symptoms there is one mentioned that of Admiral * * * * of Exeter where a Calculus did return about five months after he had been operated on by lithotripsy altho' at the time of the operation the bladder when carefully sounded seemed entirely void of any fragments

Here Baron Heurteloup himself thought that some fragment had evaded him and formed a nucleus for a new concretion but on examining it chemically it was found to consist of the Triple phosphates while the former stone was composed of uric acid not a trace of

which was now to be detected.

There are certain cases in in which Lithotripsy is said to be inapplicable_ of these one is a sacculated state of the bladder which makes it more difficult to secure the stone & diminishes the chance of an entire removal of the fragments_

With regard to securing the stone we have some cases mentioned where in spite of this complication the stone was caught with considerable facility and crushed_ As for the difficulty of removing the fragments which exists also in cases complicated with stricture of the urethra & diminution of the muscular power of the bladder the Baron uses an evacuating sound by which he is able to remove not only gravel but even small fragments.

This operation is said also to be inadmissable in cases attended with much irritability of the lining membrane of the bladder

In opposition to this it is urged that the same irritability would follow and more probably to a much greater degree the operation of Lithotomy and a case is stated in which the operation of Lithotrity was completely successful although this complication existed and in which the symptoms of irritation and inflamation instead of increasing after the operation rapidly subsided on the removal of the stone

With regard to the Mortality of Lithotripsy I can find no Tables to furnish me with any data —

Out of 34 cases mentioned by Baron Heurteloup only one fatal case is mentioned and

this was in an irritable enfeebled patient in whom the disease had existed for upwards of 20 years.)

The operation had been performed at two sittings with more than usual caution on account of the state of the patient and without producing any symptoms of having irritated the bladder — About a month after the second operation the patient sank with symptoms of congestion of the lungs and was found on opening the body to have a most extensive disease of the kidneys which were six or seven times the natural size and of a soft pulpy consistence when squeezed they exuded pus —

This case cannot be said to be a death from Lithotrity and there are no others mentioned so that I can draw no comparison between its mortality and that of Lithotomy

Lithotomy or the removal of the stone by incision

Of this operation I need not say much it is fully dealt with in most systematic works on Surgery.

There are four modes of operating

1. By lateral section 2. By bilateral section - 3. By the high operation - 4. By the recto vesical incision

That most generally indeed almost universally followed is the first of these or Lateral section

The principal part of the operation consists in cutting into the bladder by an incision through the perineum a little to the left of the median line the deeper part of which guided by a grooved staff introduced into the urethra, divides the

membranous portion of that canal, the left to be of the prostate and the neck of the bladder.

A forceps is then introduced by which the stone is seized and removed gently through the wound if the calculable found to be so large as to endanger the walls of the bladder in its removal it must be crushed as in Lithotrity and the fragments removed by a scoop.

A tube is then introduced into the bladder by the wound in the perinaeum to prevent infiltration of urine into the surrounding textures. This must be kept in for at least 36 hours when it may be removed as by that time it is probable that the parts will be sufficiently protected by a fibrinous exudation.

Lithotomy is on the whole

a safe operation but there are
fatal cases and these occur about
once every 7 or 8 cases — We
have already seen that the
operation of lithotripsy was
less successful in Children under the age of Puberty & I stated that
my was found to be the reverse

In the Norwich Hospital
the deaths before puberty were
to those occurring after as one
to four — In the Bristol In-
firmary again they were found
to be nearly equal —

Death may result from
Shock — if the bladder have been
much injured by violent efforts
to extract too large a stone — this
may bring down even the strongest
in a few hours

From Haemorrhage
if any of the branches of the
pudic or if the arteries of the
bulb be wounded during the
operation or if the prostatic
plexus be injured —

from peritonitis – which however is rare and from infiltration of urine which may happen unavoidably from the position of the bladder in the pelvis or may be caused by the incision being carried too low down.

Inflammation and swelling of the lips of the wound by preventing the egress of the urine will cause it.

Let us now consider a few of those circumstances which effect the development of calculus diseases –

Age – All ages are liable to this disease but some more than others –

Out of 355 cases operated on in the Bristol Infirmary, –

134 (males and 2 females were under 10 yrs
62 " 3 " from 10 to 20
34 " 1 " " 20 to 30
33 " 1 " " 30 to 40

37 Males and 0 females, from 40 to 50
28 " 0 " " 50 to 60
18 " 0 " " 60 to 70
2 " 0 " " 70 to 80

Out of 197 Cases occurring in the District round Leeds 83 were under 10 Years of Age 21 between 10 & 20 & 28 between 40 & 50 —
(I do not give the whole table merely the highest numbers)

Out of 34 Cases operated on by Lithotrity by Heurteloup the Ages of 2 are not stated.
2 were between 20 & 30 – 3 between 30 & 40.
4 " " 40 & 50 – 13 " 50 & 60.
9 " " 60 & 70 – 1 " 70 & 80.

From a table given by Mr Crosse of the primary Calculi in the Cabinet of the Norfolk and Norwich Hospital I find that out of 704

{ 276 were removed from Males & 10 from females of 10 Years & under }
102 were removed from Males & 6 fm females between 10 & 20.

35 were removed from Males & 8 fr. females between 20 & 30

43 " 5. " 30 & 40

41 " 1. " 40 & 50

95 " 3. " 50 & 60

66 " 2. " 60 & 70

8 " 0 " above 70

669 35

From these tables we gather that by far the greater number of cases happen before puberty in both sexes.

Children especially those of dyspeptic parents are very liable to have deposits in their urine — very little serves to derange the system in these early years and in that derangement the urinary organs share —

The number of cases is especially great before 10 but it continues great between 10 & 20 which is still a critical period and is rendered more so

so by the well known tendency which boys have to conceal any disorder looking upon sickness often as a disgrace rather than a misfortune.—

In Girls this also is a critical period and they may be rendered more prone to Calculous disorders by Tight lacing and artificial life without any exercise to which so many are subjected especially in the higher ranks— The disease may either develop itself now or the seeds of it may be sown for the next decade as seen in Mr Crosse's Table—

From 20 the number gradually lessens until we come to between 40 & 50, in the Leeds & Bristol Tables and between 50 & 70 in Kentelough's & Crosse's where it again rises

This increase is probably

owing to the fact that at that age those habits which we have formed are beginning to tell upon the constitution especially those of indolence and luxury which we have seen predispose to this complaint

At this period too any hereditary predisposition which may exist generally developes itself

Before I saw Mr Crosse's table judging from the increase in Baron Heurteloup's cases being 10 years later than that of the Bristol & Leeds tables and seeing that most of his cases above the age of 50 were Frenchmen I was inclined to think that their less stimulating diet post-poned the development of the disease

This supposition however is ~~by~~ not borne out by Mr Crosse's table

Sex – has a great

Monthly Medical Journal 1850.

influence in calculous disorders which are very rare in the female

In the Bristol table out of 353 cases only 7 were females — of the 197 occurring at Leeds only 9 were females, but out of Ormskirk's 34 only one and of Mr Crosse's 704 only 35

This doubtless is owing principally to the short and dilatable urethra which opens lower down in the bladder than in the male

Much may be due too to the habits of the female sex being in general more temperate than those of the male —

As an example of the dilatibility of the female urethra I may mention a case of Mr Briault's where a stone was passed two inches in length and nearly 3 in circumference; it weighed somewhat more than an ounce. After its expulsion the urethra

was so much dilated as to admit the finger - the urine was bloody and passed involuntarily but these symptoms disappeared in a few days.

Occupation

We have seen that want of bodily exercise and any harassing or depressing employments predispose the former to the Lithic the latter generally to the Phosphatic diathesis.

Out of the 34 cases already referred to as mentioned by Baron Heurteloup the occupations of 17 only are given - of these 5 were Medical Men 2 lawyers - 3 seamen (one of them an admiral) 2 Military Officers - 2 Farmers - 1 Baker - 1 Gilder and 1 woodcutter

Here we see that the learned professions and our own in particular hold an unenviable prominence

Those occupations which

Patissier / Maladies des Artisans
p. 365 —

call only one part of the body into exercise predisposes to derangement of the digestive organs a most fertile cause as we have already seen of calculous deposits.

Of these sedentary occupations as those of Clerks Tailors Shoemakers &c are especially hurtful — next are those which require a long continuance in the erect posture according to M. Pattissier from whom I translate "I have seen (says he) many of the servants and even of the courtiers (gentilshommes) of the Court of Spain where there is no seat called plaine of plaine in their kidnies which they attributed with good reason to a long continuance in the erect posture.

He ascribes as a reason the hinderance to the circulation in the kidnies caused by pressure of the contracted

fibres of the lumbar muscles and also which is more likely to cause calculous complaints to "la faiblesse de estomac" which is also a result of this posture from that organ not being sufficiently supported "est toujours pendant".

But it may be said there is no lack of exercise in the Medical profession why then should 5 out of 7 cases occur in it? Many Medical men have exercise enough and often more than enough while others who are able to make their visits in a carriage have comparatively little of it. All however follow a profession full truly of interest but full also of painful interest and of anxiety which often counteracts the beneficial effects of exercise. It is to be hoped

Report on Manual Labour in Literary Institutions—

however that this disease does not occur among medical men to such an alarming extent as M. Henri Delaunay's cases would show — cases too few in number to draw any conclusions from —

The prophylactic measures to be followed by those who from the nature of their occupations are rendered liable to this disease are a wholesome and nutritive diet in small volume and a moderate amount of manual labour congenial to the tastes of the individuals.

I find some interesting letters in an American work in which the writers, principally clergymen speak in the highest terms of the advantages which they had derived from cutting wood both with the Axe and saw and from other manual

Prof. Staughton. Med. Coll. Ohio

Patissier op. cit. p. 362

labours taken regularly in the intervals of study and in such quantity as not to induce fatigue

"In a word industrious habits of daily labour will metamorphose a book worm into a man: prompt and ready for all emergencies; a man of the 19th Century."

I find a proposal in a French work to employ females in sedentary occupations

"Sedentary occupations, says Jantelles ought to belong solely to females who by a complete transposition are employed in the fields in labours the most toilsome"—

Certainly with regard to those employments which pre-dispose to calculous complaints advantage would be found in substituting the female who is so much liable to be affected by them and to whom sedentary occupations are much more

congenial than reaping turnips- weeding- flax- beetling- fish carrying and those other laborious occupations in which so many of what should be the fair sex find employment.

Soldiers do not suffer from these complaints during their term of service- in later life on exchanging the labours and the in general regular diet of the field, the camp or the barrack, for the comfort of their retirement these may be induced.

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