

Urinary stones in Malaysia — its incidence and management

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Summary

The life of Lord Moynihan is briefly reviewed. Incidence of stones in Peninsular Malaysia appears to show the same trend as in other industrialised countries. Management of urinary calculi both prior to and after the introduction of ESWL in a personal series is discussed. More than 90% of urinary stones are now treated by ESWL threatening the place of surgery in Urology. The pattern of incorporating renal transplantation into the urological training programme as practised in the Institute of Urology and Nephrology in Malaysia is suggested as a way to assure a place for surgery in Urology.

Key words: Moynihan's life, urinary stones in Malaysia, incidence and management.

Introduction

In the first part of this lecture I would like to briefly trace some aspects of Lord Moynihan's life in order that we may understand and appreciate a little of the greatness of this man and his influence on modern surgery not only in the British Isles but also in the Commonwealth.

Lord Moynihan was the son of Andrew Moynihan, (Fig. 1) a soldier of Irish descent in the British army. Andrew Moynihan lived in Wakefield in Yorkshire and was married on New Year's eve in 1853. In 1857, Andrew Moynihan was awarded the Victoria Cross for the part he played in the siege and storming of the massively fortified Redan of Sebastapol. In 1858, his regiment was posted to Malta, where on October 2, 1865 Berkeley was born in a simple house where there is now a memorial tablet. His father Capt. Moynihan died in 1867 from what was thought to be Malta fever. When his father died, Berkeley was less than two years old and his two elder sisters, Ada and Eva were ten and six respectively. His mother, Ellen Anne Moynihan with her three children sailed back to England in the last month of 1867 and landed in Liverpool. Not long after this she decided to move to Leeds to stay with her elder sister, Mrs. Ball whose husband was a police inspector based at the police station in Millgarth Street in Leeds. On a meagre pension of £1/- a week from the Patriotic Fund and with the help of her sister's family Ellen Moynihan had to maintain and educate her children.¹

The suffering, courage and affection of his young widowed mother undoubtedly had a profound influence on him not only during his childhood but throughout his whole life. This affection, he expressed in a letter he wrote to his son, Patrick, (the second Lord Moynihan) when he, Sir

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Berkeley became a Peer in 1929. This letter has been quoted before and it is without apology I re-quote parts of it again. He wrote, "The greatest regret I have is that you could not know my mother, the most beautiful, kindest, most lovable mother in the world... She was the gentlest, sweetest, most considerate of people. I never heard her say an uncharitable thing of anyone; she never did an unkind act; and at immense sacrifice to herself she gave me my chance. She was terribly poor, and my education was more than she could afford: but she denied herself everything for me, it is to her that I owe everything;". According to Sir Gordon Gordon-Taylor, Lord Moynihan founded the Moynihan Lecturership in memory of his mother, Ellen Anne Moynihan.²

It is fortunate that through the good offices of Professor Pyrah I am able to reproduce a photograph of this great lady (Fig. 2). Professor Pyrah was Professor of Urological Surgery from 1956–1964 at the University of Leeds and had worked with Lord Moynihan. He is now 91 years old. He was able to obtain this photograph from the widow of Lord Moynihan's nephew, Sir Andrew Moynihan Claye who was a past president of the College of Obstetricians and Gynaecologists from 1957–1960.

Sir Andrew Claye's mother, Ada Moynihan thought the world of her brother, and on Sir Andrew Claye's 34th birthday she dedicated Lord Moynihan's book on "Abdominal Operations" to her son (Fig. 3).

After obtaining his MBBS, London, he was appointed house surgeon to Mayo-Robson (Fig. 4) whom he later described as "the greatest surgeon of all times."



Fig. 1. Andrew Moynihan.



Fig. 2. Ellen Anne Moynihan.

This book
 written by my brother
 Berkeley G. S. Moynihan
 when 34 years old.
 & given to me.
 I now pass on to my son
 Andrew Moynihan Classy
 in his 34th Birthday
 - July 18th 1930 -
 believing that he too has
 received that
 "Divine Commission"
 The Gift of Healing
 with
 The Greater Gift of Sympathy

Fig. 3. Photocopy of dedication in the front of Lord Moynihan's book on Abdominal Operations" by his sister Ada Moynihan.



Fig. 4. Sir Arthur W. Mayo Robson

In 1890 he became a resident surgical officer at the Leeds General Infirmary and in the same year obtained his fellowship. During the days as a resident surgical officer he used to frequent the house of his chief, T.R. Jessop, (Fig. 5) whose second daughter, Isabelle Wollesley Jessop, he married in 1895. He was appointed as assistant surgeon to Leeds General Infirmary in 1896 though he failed to get this same appointment when he had applied for it two years earlier. Amongst the many testimonials supporting his application there was one from his father-in-law, T.R. Jessop, who was then a Consultant Surgeon at the Leeds General Infirmary and a member of the Council of the Royal College of Surgeons. I would like to quote from his testimonial the far sighted assessment of his father-in-law which future events have shown to be true. He wrote "Men of Mr. Moynihan's stamp are very exceptional. The Infirmary staff would be enriched by his addition to it."³

In 1903, he made his first visit to America and began his close association with great American surgeons like the Mayo brothers, Murphy and Crile. Lord Moynihan brought back with him rubber gloves which were presented to him by Professor Halsted⁴ and adopted the use of cap, mask and gloves in the operating theatre.⁵ By 1910, that is at the age of 45, he had achieved a reputation in Great Britain and in America as a master craftsman, a brilliant abdominal surgeon, an orator and a great writer.

During the First World War, his boyhood desire to join the army materialised. He served in France from December 1914 to March 1915. He recognised very early, the importance of good orthopaedic facilities for injured personnel and was able, through his influence, to bring in Sir Robert Jones to establish orthopaedic centres for the army in the United Kingdom.⁶



Fig. 5. Professor T.R. Jessop.

Lord Moynihan played a very important part during the war in obtaining the co-operation, not only of his American colleagues but also in influencing the American people by his many patriotic speeches in Chicago, New York, Washington and Philadelphia. Some aspects from the address he delivered to the American College of Surgeons when he was conferred the Honorary Fellowship in 1917 included definitions on tyranny and liberty. About tyranny he said that it "is the power exercised by an irresponsible autocracy; it is the supremacy of the State carried to its ultimate expressions".⁷

About liberty he said, "And by liberty we mean here, the inalienable and indestructible right of every human being to express himself, to be himself, to develop from within".⁷ Are not these words as true today as they were when he said them 62 years ago?

British Journal of Surgery: The idea of having a British Journal of Surgery was first mooted by Professor Hey Groves of Bristol. But only after Lord Moynihan became a member of the Council of the Royal College of Surgeons of England, was the first meeting of the Committee held on February 13, 1913.⁸ With his influence and enthusiasm the first publication of the British Journal of Surgery was launched in July 1913. He remained Chairman of the Board for 23 years till the year of his death.⁸ Today, the British Journal of Surgery holds an eminent place among surgical journals of the world.

President of the Royal College of Surgeons: In 1912, Lord Moynihan received the Knighthood. He became the President (Fig. 6) of the Royal College of Surgeons of England from 1926–1928

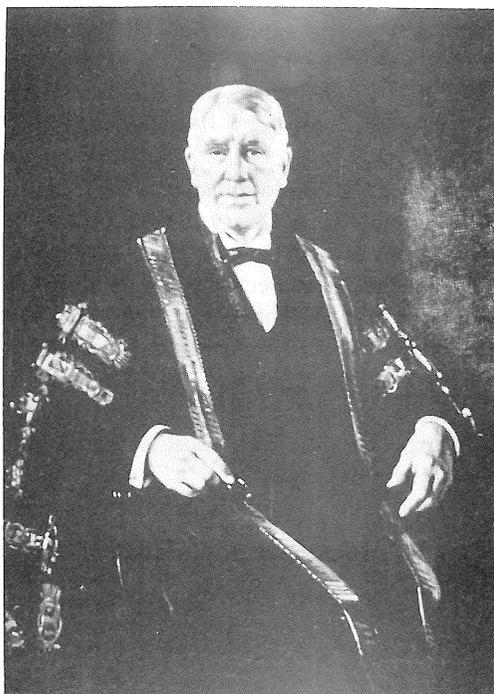


Fig. 6. Lord Moynihan, President of Royal College of Surgeons of England. Painting by Richard Jack R.A. 1927.

as Sir Berkeley and from 1929–1931 as Lord Moynihan, the first truly provincial surgeon to hold this office. During his presidency, two important events took place. One was the holding of the Primary Fellowship Examination in Australasia, India and Egypt, and the other was the formation of the Research Farm at Down, in Kent, for the promotion of experimental surgical research.⁹

In the early part of 1914, he moved from his town house into a mansion called the 'Carr Manor', where he lived out his life.¹⁰ His wife died on August 31, 1936.¹¹ After her death he wrote a short script about her which indicated what a tower of strength she had been to him all his life. He finishes the script with these words, "As a *compa* to me she was adorable.... I am sure she was proud of my career to which she contributed so much she was a small yet great and lovely lady, worthy of all honour and remembrance".¹² Six days after the death of his wife he died of a stroke in Carr Manor.¹³ Carr Manor today is a residence for circuit judges.

Lord Moynihan and Malaysian Surgery: We may not realise that many of the practices and techniques we use in the operating theatres today originated from Lord Moynihan.

He introduced the green background for draping the patient as early as 1912 and wrote about it in the *Lancet* on September 18, 1915.¹⁴ This is a practice in most of our hospitals. He was the first to use rubber gloves while operating. He laid great emphasis on the gentle handling of tissues and meticulous haemostasis and believed in using the hypnotic stitch in abdominal

surgery.¹⁵ He always insisted on adequate exposure of the operating field.¹⁵ and I wonder what he would have had to say about today's eagerness for minimally invasive surgery! He gave the name "strawberry gall bladder" to cholesterosis of the gall bladder.¹⁶ The Moynihan gall bladder forceps are a familiar sight in our theatres.

Lord Moynihan as a Urologist: Though Lord Moynihan was particularly well known as a surgeon dealing with conditions of the gastro-intestinal, biliary tract and spleen, he appears to have evinced great interest in urological conditions as well. As a surgical dresser he assisted Arthur Fergusson McGill in 1887 in performing the first prostatectomy in Great Britain, even before Freyer.¹⁷ In 1902, he reported three cases of partial nephrectomy, the first for a cyst of the lower pole of the kidney, the second for a cyst of the isthmus of a horse-shoe kidney and the third for a myxo-sarcoma of the lower pole of the kidney.¹⁸ In 1906, for a case of exstrophy of the bladder he performed the implantation of the whole bladder into the rectum.¹⁹ In 1907, he published in the Practitioner a paper entitled "A clinical lecture on suprapubic prostatectomy" describing his experiences with his first 100 cases.²⁰

Urinary Stones in Malaysia – It's Incidence and Management

Now I would like to turn to the theme of my lecture namely "Urinary Stones in Malaysia – It's Incidence and Management."

Incidence

Andersen had noted that "there is evidence of a different stone incidence pattern in the industrialised and developing groups of countries". He postulated that there existed a constant pattern between economic level and diet influencing the increase in the incidence of idiopathic upper urinary tract stones and a corresponding decrease in the incidence of lower urinary tract stones. This relationship between affluence, diet and stones was noted in many countries like Great Britain, Germany, Italy, Norway and Japan in the latter part of the 19th century.²¹ Even in countries like India, Andersen has reported, that in the Northern and Western regions where the intake of animal protein is higher than in the Southern and Eastern regions, the incidence of urinary tract stones is correspondingly higher.²²

There has been an argument that in strict epidemiological terms it is more important to know the prevalence figure or do studies on a defined population before one can refer to the incidence. But the most common practice employed when studying incidence of stone disease is to relate it to the number of discharges from the hospitals per 100,000 population. Despite the fact that the incidence of stones from hospital statistics is dependent upon a number of variables I would nonetheless adopt what has been said by Scott in 1987 i.e. "if we are to establish epidemiological data it may be that we will have to use hospital statistics. This is acceptable provided that their limitations are recognised and the findings quoted accurately".²³

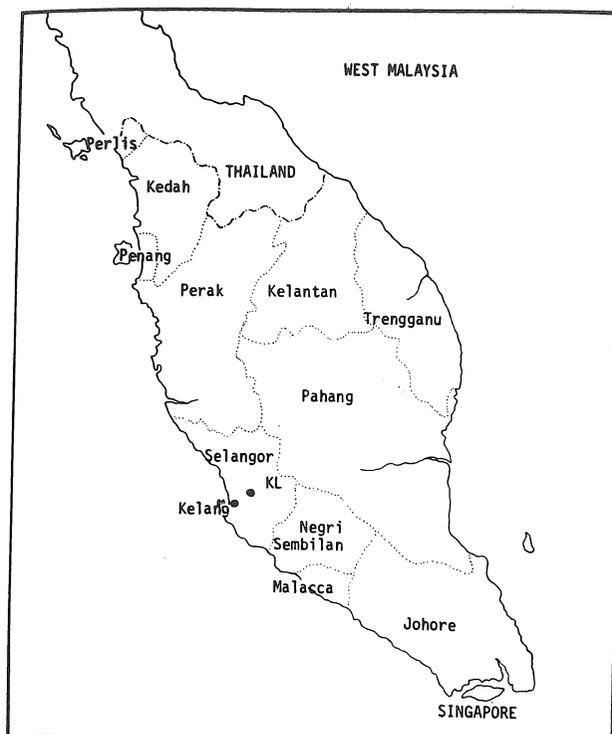
With this in mind we felt it was worth comparing the incidence of urinary calculi between the first fifteen years study (1962–1976),²⁴ done in 1980, and the next five year period (1977–1981), presently done, in the various States of Peninsular Malaysia.

The Malaysian study

The land and its people: Peninsular Malaysia is a tropical country and has a land frontier with Thailand in the north. In size, it is a little larger than England without Wales and a little smaller

than the American State of New York. The country is divided into eleven States and Kuala Lumpur is now the Federal Capital (Fig. 7).

Malaysia has a multi-racial population and the three main ethnic groups are the Malays, the Chinese and the Indians. In accordance with the 1970 and 1980 Census, Peninsular Malaysia had a total population of 8,900,971 in 1970 and 11,427,000 in 1980. Table 1 shows the percentage of community population in Peninsular Malaysia in 1970²⁵ and 1980.²⁶



States of mainland Malaysia.

Fig. 7. Map of Peninsular Malaysia with the eleven States.

Table 1
Percentage of Community Composition in Peninsular Malaysia
1970²⁵ and 1980²⁶

	1970	1980
Malays :	53.2%	55.25%
Chinese :	35.4%	33.9%
Indians :	10.6%	10.2%
Others :	0.8%	0.65%

Materials and Methods

The studies were done on the incidence of urinary calculi in the kidney and ureter and other parts of the urinary tract in 1980 and 1989. The first study in 1980 covered the years 1962–1976 in five year periods and the second study done in 1989 covered the years 1977–1981, a further five year period (Table 2). The statistics used for both the studies were from the Ministry of Health Returns prior to the introduction of the new coding system in 1984. As such, a further five year study is not comparable and therefore not undertaken. Both the studies appear to show a linear relationship between affluence, industrialisation and diet confirming the findings of Andersen in other industrialised countries. It also showed that the incidence of lower urinary tract stone was correspondingly lower in comparison to the incidence of stones in the upper urinary tract, again being similar to Andersen's findings (Figs. 8 and 9).

Table 2
Incidence of Urolithiasis 1962–1981 per 100,000 Population

State	1962 – 1966			1967 – 1971			1972 – 1976			1977 – 1981		
	K & U	O	Total	K & U	O	Total	K & U	O	Total	K & U	O	Total
Kedah	3.1	9.5	12.6	2.5	9.3	11.8	7.6	2.6	10.2	22.9	6.8	29.7
Perlis	27.0	2.5	29.5	10.0	7.5	17.5	27.6	13.5	41.1	21.8	11.9	33.7
Penang	19.6	5.2	24.8	30.0	8.4	38.4	34.1	7.2	41.3	44.7	20.2	64.9
Perak	14.4	7.5	21.9	13.7	6.9	20.6	21.6	9.7	31.3	30.2	7.1	37.3
Selangor	4.9	10.6	15.5	26.3	29.1	55.4	37.4	13.6	51.0	40.0	6.4	46.4
N. Sembilan	26.9	12.7	39.6	16.7	18.4	35.1	9.0	44.1	53.1	34.3	25.1	59.4
Malacca	9.4	6.8	16.2	15.0	4.7	19.7	19.0	3.4	22.4	15.3	5.1	20.4
Johore	12.5	7.0	19.5	13.3	11.5	24.8	9.7	9.3	19.0	16.0	6.7	22.7
Kelantan	8.4	3.6	12.0	24.9	4.4	29.3	33.3	3.6	37.0	33.7	18.7	52.4
Trengganu	9.8	3.3	13.1	6.6	8.6	15.2	21.0	11.7	32.7	13.1	24.9	38.0
Pahang	11.7	7.8	19.5	16.8	8.2	25.0	17.3	7.2	24.5	26.0	11.8	37.8
Total	147.7	76.5	224.2	175.8	117.0	293.8	237.7	125.9	363.6	298.0	194.7	442.7

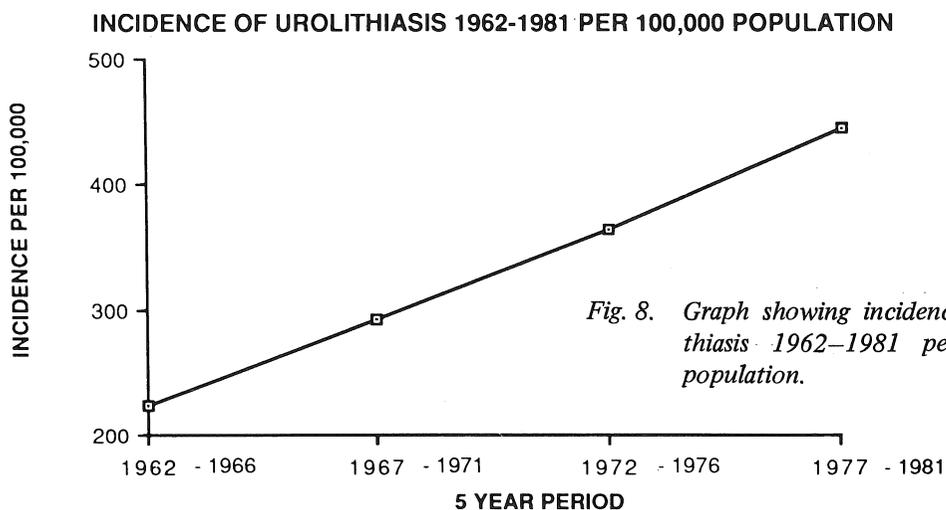


Fig. 8. Graph showing incidence of urolithiasis 1962–1981 per 100,000 population.

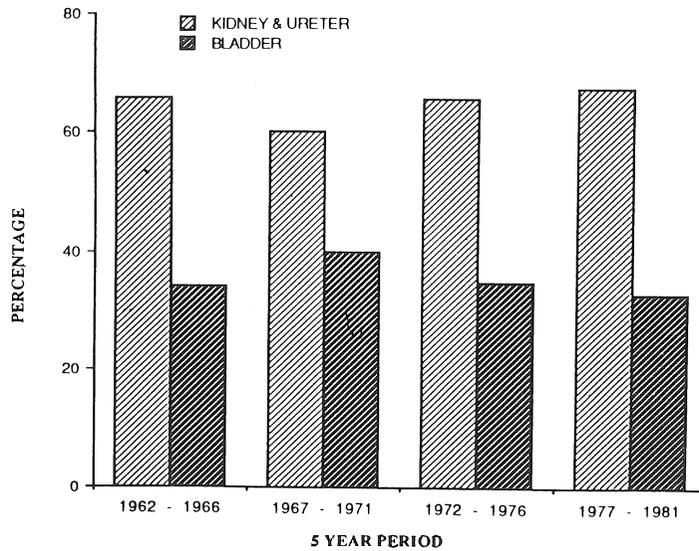


Fig. 9. Graph showing percentage incidence of stones in the kidney and ureter and bladder.

In order to study the ethnic, sex and age distribution of urolithiasis in the three major ethnic groups it was decided to combine the total cases operated on for stones at the Institute of Urology and Nephrology, General Hospital, Kuala Lumpur and the author's wholly urological private practice for the years 1976-1987. The total number of cases thus studied were 4203 of which 3178 were from the Institute of Urology and Nephrology and 1025 from the author's personal series.

Ethnic incidence: Of the 4203 studied, 1571 or 37.4% occurred in the Malays, 2018 or 48% in the Chinese, 558 or 13.3% in the Indians and 56 or 1.3% occurred in the others (Fig. 10).

INCIDENCE OF CALCULI IN THE 3 MAJOR COMMUNITIES

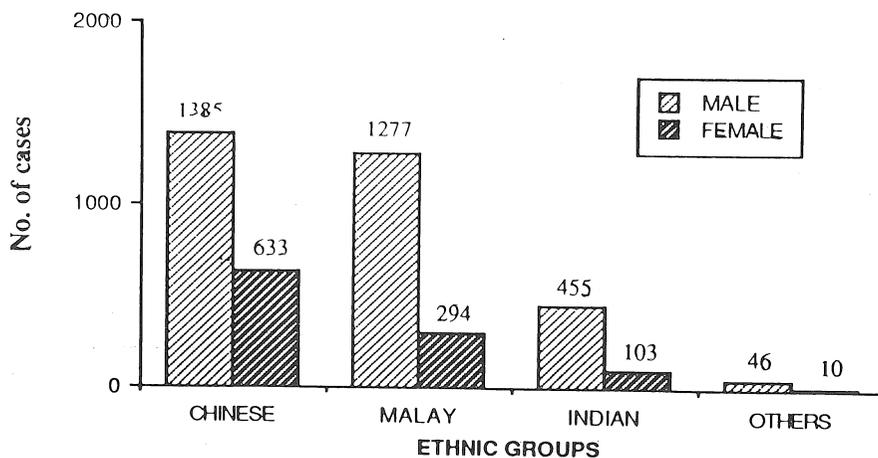


Fig. 10. Graph showing incidence of calculi in the 3 major communities.

Unlike the Bantus of South Africa and the Negro population in America the incidence of urolithiasis between the three ethnic groups in Malaysia living in the same environment showed no significant variation proportionate to the population.²⁷

Age distribution: In this study, the highest incidence of stones was between the ages of thirty and fifty in all the three ethnic groups (Fig. 11).

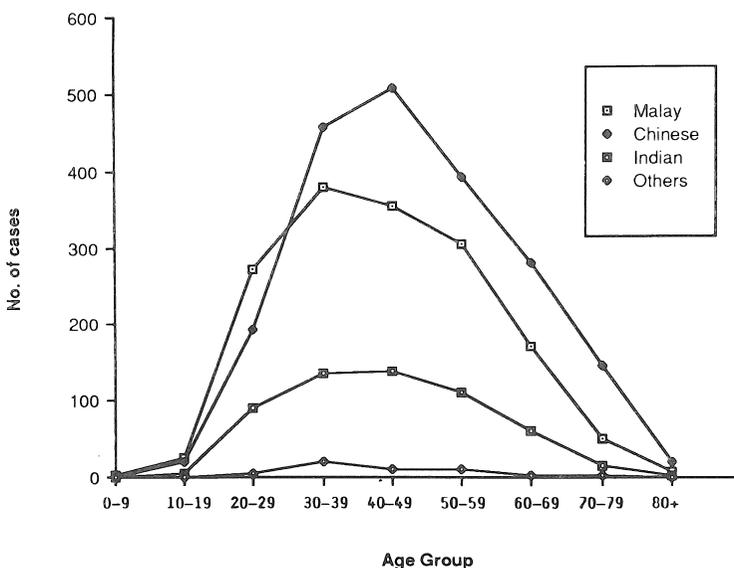


Fig. 11. Graph showing age distribution of urinary calculi.

Chemical and crystallographic analysis of urinary stones: 510 stones were analysed in 208 of our patients by a commercial firm in Florida. This showed that 81% of stones were calcium containing, 5% were struvite, 3.5% were uric acid and 0.5% were cystine (Table 3). When our figures are compared with the percentage composition of urinary stones of some of the industrialised countries like Great Britain, U.S.A. and Japan, Malaysia shows a similar high incidence of calcium containing stones (Table 4).²⁸

Institute of Urology and Nephrology

Urology was not a separate specialty in Malaysia till 1968. Urinary stones and other urological problems were dealt with by general surgeons.

I was trained to do haemodialysis in Manchester and I did the first haemodialysis on the Kolff machine at the General Hospital, Kuala Lumpur in 1964. Gradually problems like watering-can perineum, urethral injuries and large staghorn calculi were taken over for management. About this time, the late John Swinney from Newcastle-on-Tyne (Fig. 12) amongst others visited us and encouraged me to pursue the establishment of an independent urological unit. With the help of the Kidney Foundation of Malaysia I set out to establish a combined unit of Urology and Nephrology doing dialysis on the one hand and the rest of urological surgery on the other. For this I had the help of F. Proehoeman. An old open ward and the adjacent

Table 3
Chemical and Crystallographic Analysis of Stones
 Total Number of Stones Analysed – 510 in 208 Patients:

	Total	Percentage
Calcium Oxalate Monohydrate – 124)	412	81.0%
Calcium Oxalate Dehydrate – 152)		
Calcium Phosphate – 136)		
(Hydroxy Apatite))		
Magnesium Ammonium Phosphate (Struvite)	25	5.0%
Uric Acid	18	3.5%
Cystine	2	0.5%
Others	52	10.0%

Table 4
Percentage Composition of Urinary Stones – A Comparison

	U.S.A.*	Great Britain*	Japan*	Malaysia*	India*	Thailand*
Calcium	72.3	79.4	81.0	81.0	74.0	68.7
Infected	19.0	15.7	14.5	5.0	22.0	11.9
Uric Acid	5.8	3.8	3.6	3.5	3.0	6.4
Cystine	2.9	1.2	1.8	0.5	N.D.	N.D.
Others	0.0	0.0	0.1	10.	1.0	13.0

* From Table 10.1 in Robertson.²⁸

temporary operating theatre that were about to be demolished were offered to us and here the unit commenced in the middle of 1969 (Fig. 13). In the same year, we started a modest chronic dialysis programme.

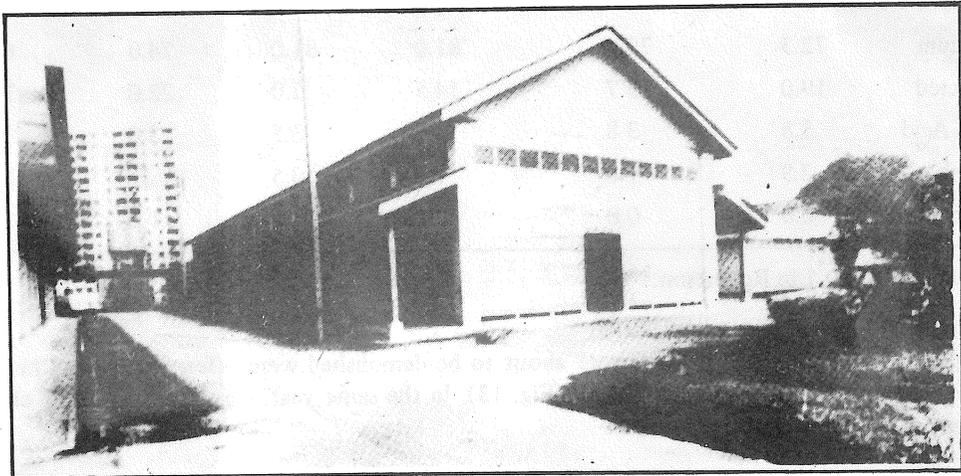
Following this it was decided that over the next few years a fully self-contained Institute of Urology and Nephrology should be developed which besides doing urological and nephrological work would also undertake renal transplantations. The area adjacent to the temporary operating theatre was offered and the building of the Institute materialised.

Management of Urinary Calculi

Renal stones: The management of urinary stones in Malaysia is probably not very different from its management in other countries. But I would like to highlight our experiences and approach to some of our problems. Before 1965 pyelolithotomy, nephrolithotomy and splitting of the



Fig. 12. Professor John Swinney.



Old ward 4 was allotted to urology in 1968 for the treatment of male urological patients.

Fig. 13. Old Ward 4 allotted to Urology in 1968.

kidney, were methods used for large and staghorn calculi with all their associated complications. The extra capsular approach to the renal sinus described by Gil-Vernet in 1965 constituted a major urological advance in the operative management of staghorn calculi.²⁹ This procedure was introduced in our Department of Urology in 1969 and has remained the popular method. In cases where there was an intra-renal pelvis and marked adhesions around that region, a modified 'V' shaped incision where the apex of the 'V' was placed in the region of the pelvi-

ureteric junction, was found to be useful. At the time of closure this 'V' incision was closed in the form of a 'Y' to improve drainage.³⁰ Results of Gil-Vernet procedures as elsewhere have been uniformly good.

Renography: The year 1972 saw the introduction of Renography in our hospital and we had the invaluable services of Keith Britton. Bilateral renal calculi and bilateral obstructive uropathy were common problems. We always found it difficult to decide which side to operate on first. We were able to establish that when there is bilateral obstruction, one should relieve the obstruction in the better functioning kidney as shown by renography.³¹ This is because the better functioning kidney recovers more quickly after relief of obstruction. Renography has also been found to be valuable in the management of acute urate nephropathy and the follow up of these cases.

Ureteric stones: A standard ureterolithotomy is performed for upper third and middle third ureteric stones. An angled Babcock ureter holding forceps designed locally has been useful in preventing the stone slipping back into the upper ureter. These forceps are set at an angle of 45° and the frames suitably rounded to effect a non-traumatic closure. The overall length of these forceps is twenty centimeters. These forceps being angled are out of the surgical field and the incision on the stone can be made on direct vision.³² Unless the ureterotomy incision is more than one centimeter in length the ureterotomy is left open. Long term follow-up have indicated good results rarely leading to ureteric stricture. Stones in the juxta-vesical ureter and intra-mural ureter present a special problem if they have been impacted there for a considerable period of time. It is anatomically important to decide on the site of these stones as dissection in this area is particularly difficult. It has been found useful to dissect the juxta-vesical portion of the bladder and the ureter by careful retraction and by incising on the stone, the impacted stone is removed. When the stone is removed and the retraction is withdrawn the bladder falls back on the ureterotomy and does not require closure. This procedure avoids opening the bladder and a combined intra- and extra-vesical manipulation.

Davis' Loop extraction of stones: Trans-urethral manipulation is attempted to remove ureteric calculi in the lower third of the ureter using Blandy's rule of five.³³ We favour the use of the Davis' Loop Extractor and the success rate has been in the region of 70%. More recently by using two Davis' Loop Extractors, we have been able to extract larger stones more easily and prevent the slipping of the stone which is experienced when the single loop technique is used.

Bladder stones: The pattern of bladder stones has changed considerably over the years. It is interesting to note that the incidence of bladder stones is much higher in neighbouring Thailand than in Malaysia.³⁴ In the management of bladder stones where litholapaxy is not feasible supra-pubic cystolithotomy is done for removal of large bladder calculi. The removal of one giant calculi weighing 2.5 kg is the largest in the author's local experience.³⁵

1974 and after: On my retirement from Government service in 1974, the physical structure of the new Institute of Urology and Nephrology was fast developing and there was a very strong nucleus of dedicated workers to fulfill its objectives.

Renal transplantation and chronic dialysis: Hussein bin Awang took over the unit in 1974 and developed the transplantation programme. At this time, Abu Bakar bin Suleiman joined the Institute and very rapidly developed the dialysis programme not only in the Institute but throughout the country by adding both home and office dialysis.

Centre dialysis programmes have now been established in nine other centres throughout the

country and the total number of patients on centre dialysis has gone up from 71 in 1981 to 246 in 1988. Home dialysis also has increased from 29 in 1981 to 319 in 1988. The Institute has done 321 living donor transplants till the end of 1988 and six cadaveric transplants. Renal transplantation is a joint effort between the units of Urology and Nephrology.

Changing Trends in the Management of Urinary Stones

In 1880 three years before Berkeley Moynihan entered Medical School,³⁶ Sir Henry Morris removed the first kidney stone.³⁷ A hundred years later in 1980 extracorporeal shockwave lithotripsy was introduced for clinical use by Christian Chaussy and his co-workers.³⁸ Since then the role of open surgery has been debated and indeed threatened. Now almost 90% of urinary stones can be treated by some form of ESWL.

Experiences with Extracorporeal Piezoelectric Lithotripsy in Kuala Lumpur: I would like to report the experience with the use of the EDAP LT 01 in a personal series of 258 cases from January 1988 to June 1989. Of these 138 were Chinese, 77 Malays, 38 Indians and five others. Male to female ratio among the 258 patients treated by ESWL was 3:1.

The location and number of stones are shown in Table 5. Of the 86 renal stones one was in a horse-shoe kidney.

Of the 258 cases, 27 are still continuing treatment and in the 231 cases in the which ESWL treatment had been completed there were nine failures giving an overall success rate of 96%. Of the nine failures, four were renal stones, of which three were staghorn and one larger than 2 cm in size. The three staghorn stones were removed by Gil-Vernet procedure.

The fourth, a large renal stone had to have a nephrectomy because of pyonephrosis. Amongst the staghorn cases that were treated successfully by ESWL, renal function was considerably reduced after treatment was completed in two cases for reasons that could not be explained. But one could probably suspect some renal damage as a result of ESWL. This is an area in which further research needs to be done.

Table 5
Details of Location of Stones in 271 Stones in 258 Cases

Kidney Stones	:	86		
Staghorns	:	47		
Renal Pelvis	:	44		
Ureteric	:	83		
Bladder	:	11		
				271 Stones
Successful	:	222	—	96%
Failure	:	9	—	4%
				231 Cases
Still continuing treatment	:	27		Cases

The remaining five stones were ureteric stones of which only one stone was larger than 2 cm in size. All these five cases were treated by ureterolithotomy. Ureteric stones lying on the sacro-iliac joint in our series could not be treated in situ position by our EDAP machine without manipulation.

One feature of our experience has been the management of large bladder stones by ESWL. Of the 258 cases, 11 were bladder stones greater than 2 cm in size. In the EDAP LT 01 lithotripter the patient is placed on his abdomen (prone position) with a full bladder and ESWL is carried out. There was excellent fragmentation. But in two cases an endoscopic bladder wash-out had to be done. The bladder mucosa visualised at the time of endoscopy showed marked haemorrhagic inflammation of the whole bladder wall.

We have been able to treat ureteric stones within 4 to 5 cm of the vesico ureteric junction in the same manner using a full bladder and placing the patient on his abdomen.

Treatment of stones in patients with acute renal colic by ESWL: There does not appear to be any published report on the treatment of stones causing acute renal colic by ESWL. We have used it in the treatment of nine such cases and have been impressed by the results. In all of them not more than two treatments were necessary.

ESWL has been found useful in the treatment of acute renal colics in the following groups of patients.

1. Airline pilots.
2. Seamen waiting to join ships.
3. Executives with urgent schedules.
4. Patients with recurrent severe pain with little or no movement of stone.

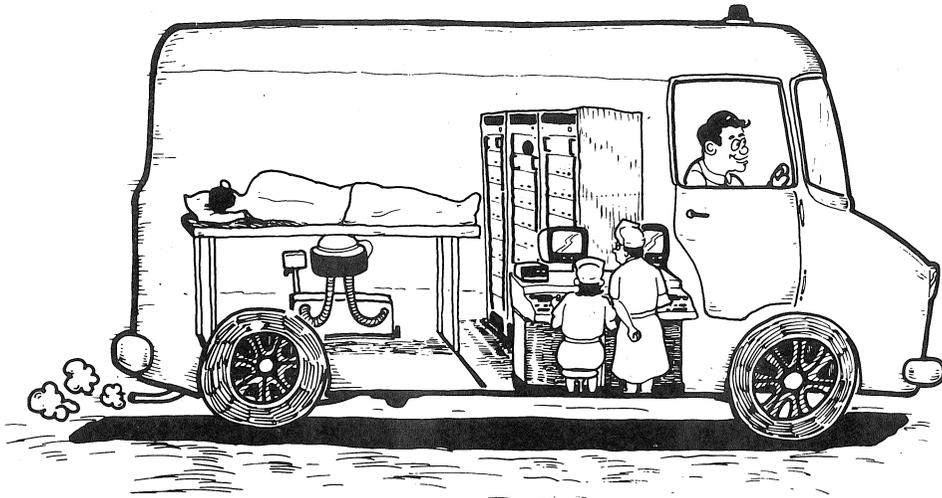
Results of ESWL treatment compared: Table 6 compares our results with that of few other centres.^{3,9}

Table 6
Results of ESWL treatment compared:

	Munich	Stuttgart	UCLA	Author's series
Date of Commencement of ESWL	2/1980	10/1983	3/1985	1/1988
Success Rate	99%	99.1%	99.5%	96.0%

At this point I am reminded of Lord Moynihan's quotation from his Listerian Oration. "Statistics, as I said long ago, may prove anything, even the truth".⁴⁰ To some extent this may be true when statistics regarding ESWL are compared from different centres.

Itinerant lithotripter: Jacques (1651-1714) was an itinerant lithotomist of his time.⁴¹ There are moves now to use expandable trucks to carry the lithotripter to smaller centres to perform ESWL. We had an itinerant lithotomist in the eighteenth century and in the twentieth century we are likely to have an itinerant lithotripter (Fig. 14).



Itinerant Lithotripter

Fig. 14. Itinerant Lithotripter.

Future of Surgery in Urology: The advent of the Extracorporeal Shockwave Lithotripsy (ESWL) has revolutionised the management of urinary stones. We have come to a stage where 90% of urinary calculi can be treated by this non-invasive technique. This is particularly so when the stone is below 2 cm in size. With larger stone burdens there is a difference of opinion as to whether these should be treated by a combined approach using Percutaneous Nephrolithotomy (PCNL) and Electro Hydraulic or Ultrasonic Lithotripsy or open surgery. For ureteric stones, extraction by the rigid ureteroscope can be used with ultrasonic or electro-hydraulic lithotripsy. More recently pulse dye laser has been very successful in ureteroscopic stone removal. These minimally invasive techniques are suggested as an alternative to open surgical removal of stones. Some of the complications of minimally invasive methods however appear to be formidable and sometimes hair raising. These complications include excessive bleeding, peritonitis, gut or pleural perforation, ureteric perforation, AV fistula formation and the like.⁴² One of the other complications is the avulsion of a large segment of the ureter. This type of injury may need a Boari flap repair, auto-transplantation of the kidney or even nephrectomy – major procedure to remove a small stone! It appears that sometimes major invasive surgery is required to correct the complications of minimally invasive surgery! These types of complications have led to more stones being treated by non-invasive ESWL alone. Whilst there is no concrete evidence at the moment that chronic renal damage or hypertension occurs in patients treated with ESWL, some recent studies using NMR do indicate renal changes when shockwave lithotripsy is used. I am sure research in this direction will be occupying the minds of nephrologists and urologists in the next decade.

Of course indications for intervention vary from place to place and there are still many grey areas where émotion, experience and economic factors rather than clinical indications influence the choice of management. However, it is becoming more and more apparent at least in some centres in the United States and the United Kingdom that there is a definite place for the management of staghorn and large urinary calculi by open surgery.⁴³ A strong case can be made for removing staghorn calculi by open surgery, especially if there has been no previous operation done on that kidney. The stone can be removed completely and the residual stone rate will be much lower. Surgical removal of large impacted stones in the lower third of the ureter may also be the right

choice. In Europe and the United States, at the rate new lithotripters are installed I doubt if any stone in the renal tract would be allowed to grow larger than 2 cm!

If the operations done for urinary stones in the respective State hospitals and the University Hospital of Malaya and the University Sains Malaysia are studied, it is evident that surgical intervention for stones still plays a major role (Table 7 (a & b)). Financial constraints will limit the establishment of lithotripter centres, and the use of endo-urological and laser equipment in developing countries for some time to come.

Table 7 (a)
Operations for Urinary Stones in the Various States of Peninsular Malaysia, U.H. and U.S.M.
1984-1988

Type	Perlis	Kedah	Penang	Perak	N.S.	Malacca	Johore	Kel.	Treng.	Pahang	U.H.	U.S.M.
Ureterolithotomy	32	59	78	78				42			107	19
Gil-Vernet							5		3	10		
Urethrolithotomy	10	7	3	4				9			8	12
Nephrolithotomy	21	20	8	34	3	14	1	24	5	4	21	1
Nephrectomy					16	8	2		4	3	1	3
Pyelolithotomy	48	46	34	47	43	30	26	43	11	23	96	24
Partial Nephrectomy					15						12	
Litholopaxy		1	41	1							50	31
Vesicolithotomy	31	145	63	4							216	70

Table 7 (b)
Breakdown of Urinary Stone Operations in General Hospital
1976-1987

Type	Total
Nephrolithotomy	253
Pyelolithotomy (Gil-Vernet)	1072
Ureterolithotomy	852
Ureteric Basket	20
Litholapaxy	525
Supra-public Lithotomy	289
Pyelolithotomy & Nephrolithotomy	116
Pyelolithotomy & Ureterolithotomy	40
Ureterolithotomy & Nephrolithotomy	10
Nephrolithotomy, Ureterolithotomy & Pyelolithotomy	1
Total	3178

But as time goes on, however, there will be less and less stone surgery in all countries of the world as research is likely to produce cheaper lithotripter equipment which can be more widely used even in developing countries.

In order that urologists continue to know how to handle kidneys during surgery, an experience which many urologists may be losing, I would like to suggest that renal transplantation besides other forms of urological work be incorporated into the urological training programme. It will give them the opportunity and the joy of handling kidneys and to still use surgery in urological work and also to study what Lord Moynihan used to call "the pathology of the living" a phrase he used to describe the advantages the surgeons had over the pathologists.⁴⁴ Since 1968, we have by design planned that the Institute of Urology and Nephrology in Kuala Lumpur be a joint Institute handling all urological and nephrological problems under one roof including renal transplantation (Fig. 15). This joint venture as it were, between the urologists and nephrologists has proven fruitful and helpful in more than one way. There is a good nucleus already present and hopefully it will grow and develop. This type of organal specialisation I feel is worthy of consideration even elsewhere.



Fig. 15. Institute of Urology and Nephrology General Hospital, Kuala Lumpur.

Where better can I make an appeal for this than in a lecture dedicated to one of the greatest master surgeons of the age, Lord Moynihan.

This brings me to the conclusion of my lecture and I will leave you not with my words but more appropriately with the words of Professor Pyrah (Fig. 16) recollecting his times with Lord Moynihan which I had the privilege of taping during my visit with him in July this year.



Fig. 16. Professor L.N. Pyrah.

“He asked me to do the locum house surgeon for three months, so I did, and that was a great privilege because I had to do operations and so got to know him fairly well and I knew him better than most people, you see. He was a very charming man and had a magnificent presence. He was always punctual. He was a very good teacher indeed. A beautiful operator. He was very, very, very hardworking, very energetic. He once said a surgeon needs to have the wisdom of Aristotle, courage of a lion and gentle hands of a lady. He was the best after dinner speaker I have ever heard”.

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