

amount in the diet of vegetarians. Both groups seemed to be deficient in iron, as indicated by the low M.C.H.C. The finding of koilonychia and flattened nails supported this idea.

Clinically the two dietetic groups presented no differences. Relevant past illnesses and helminthic infection were scarce, but, as has already been emphasized, four of the ten vegetarians with a possible precipitating factor showed appreciable macrocytic anaemia. Of the 32 remaining vegetarians to whom no precipitating factor could be assigned four showed a comparable degree of macrocytic anaemia (red cells below 4,000,000 and M.C.V. above 110 c.μ). This difference in the incidence of anaemia was, however, not significant. Thirteen meat-eaters had similar precipitating factors but, as already stated, none showed anaemia; the higher incidence of anaemia amongst the vegetarians with precipitating factors (4 out of 10) was thus significant. In other words, there was strong evidence to show that under the particular conditions of diet, work, and coincident illness 20 oz. of fresh mutton a week was sufficient to prevent the development of macrocytic anaemia.

The incipient macrocytic anaemia among the vegetarians doing full duties and the high yearly admission rate to hospital (54.1 per 1,000) of vegetarians with nutritional macrocytic anaemia, often severe and serious, could be linked. Any factor putting the bone marrow of such "normal" men to a haemopoietic stress can be understood to bring out a complete picture of haemopoietic failure and gross anaemia of the macrocytic type. That this did happen is borne out by the significantly higher incidence of precipitating factors among vegetarian anaemia patients as compared with men at work. All except one of the vegetarian anaemia cases in hospital had one or more of such factors operating. On the other hand, there were only ten instances (out of 42) of this happening in the vegetarians at work. Malaria, bacillary dysentery, and hookworms were the three commonest precipitating factors in the anaemia series.

Three of the vegetarians showing moderate to severe macrocytic anaemia were admitted to hospital for fuller investigation, including repeated stool examinations, Kahn test, gastric analysis, and skiagram of chest. In one case there was a history of an attack of bacillary dysentery six months previously, but nothing abnormal was observed at the time of the present investigation. The other two had had no illness for at least the previous eighteen months, and thorough clinical and laboratory investigation in hospital revealed no other abnormal findings. Rest in bed and the unit diet led in both cases to return of a normal blood picture within four weeks (Table V).

TABLE V.—Result of Treatment of Two Cases of Anaemia Among the Vegetarians

Case No.	Time	R.B.C. (millions)	Hb (g.)	M.C.H.C. %	M.C.V. c.μ
1	On admission	2.7	11.64	28.1	153.4
	4 weeks after unit diet and bed rest	4.8	14	31.1	93.7
2	On admission	3.7	14.7	30.6	128.6
	4 weeks after unit diet and bed rest	5	14.7	32.6	90

At the time of the investigation it was questioned whether diet alone without precipitating factors was capable of producing a nutritional macrocytic anaemia. According to Thomson (1944), "It is doubtful if this nutritional macrocytic anaemia has ever been described in cases without some unusual strain on haemopoiesis, such as that of pregnancy or malaria." There appears to be little doubt that this does happen under certain conditions of hard physical work even when the total daily calorie intake is over 3,000 and

vegetable protein over 80 g. The part played by work on a borderline diet is easily understood, and was well illustrated by the brisk haematological recovery of the two anaemia cases on being put to bed on the very diet which had produced their anaemia. Several workers have recently recorded cases of nutritional macrocytic anaemia due to diet alone and without precipitating factors (Moore *et al.*, 1944; Watson and Castle, 1946; Spies *et al.*, 1948).

Summary

Haematological investigation of a group of vegetarian and meat-eating Indian soldiers doing full duties in a desert garrison of about 17,000 meat-eaters and 1,188 vegetarians, the latter of whom showed a high hospital admission rate of nutritional macrocytic anaemia, revealed that on the average the vegetarians exhibited a statistically significant lower blood level, with macrocytosis. A number were suffering from frank nutritional macrocytic anaemia. The vegetarians' sternal-marrow nucleated red cell percentages were also significantly different from those of the meat-eaters and had a higher megaloblast-erythroblast level.

In the absence of any constant aetiological factor other than diet the haematological differences were concluded to be due to the lack of the weekly ration of 20 oz. of fresh mutton in the vegetarians' diet and the consequent insufficiency of haemopoietic requirements. The raily rations contained over 3,000 calories and over 80 g. of vegetable protein.

It was shown that under conditions of hard physical work diet alone, unassisted by precipitating coincident diseases, could bring about a frank nutritional macrocytic anaemia.

There was suggestive evidence of widespread iron deficiency in both groups.

We wish to thank Professor Chandrasekhar, of the All India Institute of Hygiene and Public Health, Calcutta, for the statistical calculations, and the D.M.S. in India for permission to publish this paper.

REFERENCES

Hynes, M., and Whitby, L. E. H. (1938). *Lancet*, 2, 249.
 Moore, C. V., Vilter, R., Minnich, V., and Spies, T. D. (1944). *J. Lab. clin. Med.*, 29, 1226.
 Napier, L. E., and Das Gupta, C. R. (1942). *Haematological Technique*. Calcutta.
 Spies, T. D., Lopez, G. G., Stone, R. E., Milanes, F., Toca, R. L., and Aramburu, T. (1948). *Lancet*, 1, 239.
 Taylor, G. F., and Chhuttani, P. N. (1945). *British Medical Journal*, 1, 800.
 Thomson, A. M. (1944). *Proceedings of the Conference of the Medical Specialists, Central Command and North-Western Army*, p. 8. Army in India Publications.
 Watson, J., and Castle, W. B. (1946). *Amer. J. med. Sci.*, 211, 513.

TOTAL CYSTECTOMY

BY

B. R. SWORN, M.B., F.R.C.S.

Honorary Surgeon, Stafford General Infirmary

Malignant disease of the urinary bladder is fairly common and if untreated usually causes great suffering, especially in its later stages. Cystectomy itself is not a difficult operation, but the diversion of the urinary flow which it necessitates is not so simple. A cystitis is often present quite early in malignancy; this responds poorly to the usual forms of treatment, and in elderly people soon leads to an ascending infection with dilatation of the ureters and renal insufficiency. In such cases transplantation of the ureters into the colon becomes a very hazardous procedure, and the general surgeon has been loath to undertake it. The choice of technique, too, has been a difficulty. The simple ones have not been satisfactory, and the more elaborate seemed suitable only for the specialist. This at any rate has been my own experience.

Some years ago, however, a method was introduced of implanting the ureters into the colonic wall, without

interrupting their continuity with the bladder, as a first stage. After the lapse of about three weeks the ureters are divided a short distance below the site of the implant and the upper end is tucked into the colon through a small incision in its wall. The object is to allow the ureter to get over the stage of oedema and constriction due to its inclusion in the wall of the bowel and also to obtain a new blood supply from adhesions before it is subjected to the risk of infection from faecal contamination.

The method seemed so sound and reasonable that I decided to try it. My first case was in 1946, and I have now done six cases in all, with no operative mortality. The number of cases is of course very small, but they are all that I have seen in the interval, and I believe the operation can be performed with a good chance of success by any general surgeon.

The Operation

It may not be out of place to give a description of the operation. I have used a right paramedian incision extending a little above the umbilicus. The bladder is first examined and the question of operability decided; then the left ureter is found on the posterior abdominal wall and isolated for a few inches. A convenient part of the lower colon is chosen and an incision made through the peritoneal and muscle coats down to the mucous membrane.

The size of the ureter varies considerably in these cases, but usually an incision about $1\frac{1}{2}$ in. (3.75 cm.) in length and slight separation of the divided muscle coats are sufficient to make a comfortable bed for it. It is very important that the area should be properly peritonized. A similar procedure is then carried out on the right side and the abdomen closed.

There may be anuria or a very diminished quantity of urine for 48 hours following the operation, but after that the flow is normal. In most cases the patient will have been on urinary antiseptics before operation, and these should be continued when the flow is restored.

In all my cases there has been considerable trouble after this stage from abdominal distension and tympanites, which may last up to a week or ten days before the bowel regains normal function. A most important benefit of the operation is that this phase is passed before the ureter is opened into the bowel.

The second stage is best done three weeks later, and for the last of these weeks the patient is given a course of sulphasuxidine or some similar drug. At the second operation the abdomen is opened through the same incision, which is now carried down to the pubes.

Again I am accustomed to do the left side first. The peritoneum is divided over the ureter so as to expose it just below the implant and is cleanly divided about $\frac{1}{2}$ in. (1.25 cm.) below this. A small incision is made into the lumen of the colon as close as possible below the implant and the upper divided end of the ureter passed into the bowel, which is then sutured round it. A little sulphanilamide powder is rubbed into the area and the peritoneum is closed over it. The right side is treated in a similar fashion.

If the bladder is considered to be removable the cystectomy is then carried out. This is largely extraperitoneal, although it is usually better to include the peritoneum over the site of the tumour. The pelvic peritoneum is reconstituted and the space below drained through a separate suprapubic stab wound. The abdominal incision is then closed. There is remarkably little upset following this stage, considerably less than after the first one. Although there is some discomfort from the urinary incontinence, this seldom lasts more than a few days.

Case Histories

Case 1.—A man aged 38 had papilloma of the bladder treated by diathermy in 1942. Cystoscopy was done at intervals, and the bladder was clear until 1944, when he was found to have multiple papillomata. He continued to have attacks of haematuria until 1946, when I first heard of the present operation. On July 17, 1946, the first stage—implantation of ureters—was performed. The second stage, including cystectomy, was carried out on Aug. 14. Although the bladder was an almost solid mass of papillomata the pathological report was: "Histological appearances are still those of an active papilloma and not of outspoken carcinoma." When last seen, in April, 1948, he complained of some pain in the left renal area. The blood urea was normal, and nothing was found except tenderness in the left loin posteriorly.

Case 2.—A man aged 48 had had haematuria for two months. On Oct. 30, 1946, cystoscopy showed carcinoma above the right ureter. The first-stage operation was done on Nov. 4. A mass on the right side of the bladder was fixed to the pelvic wall—doubtful operability. On Nov. 25 the second stage, including cystectomy, was carried out. The growth was adherent to the pelvic bone and had to be scraped off it. The pathological report was: "Anaplastic carcinoma, mainly of squamous type, infiltrating the muscle." This man did very well so far as the transplantation was concerned, but two months after the operation he complained of severe pain in the right hip. A radiograph taken on March 2, 1947, showed destruction of the right acetabulum and internal dislocation of the femur. He died a few weeks later from local recurrence of growth. There were no renal symptoms.

Case 3.—A man aged 60 had had haematuria, dysuria, and frequency for two weeks. Cystoscopy showed carcinoma of the bladder—several tumours. At the first-stage operation on Feb. 5, 1947, the bladder was considered removable. The second stage and cystectomy were carried out on March 3. The pathological report was: "Anaplastic squamous carcinoma involving the muscle of the bladder. The three apparently separate masses have the same structure." He remained quite well for 14 months after the operation and then developed spinal secondaries. He had no renal trouble up to the time of his death.

Case 4.—A man aged 45 had had attacks of dysuria and frequency for three years. On Dec. 12, 1945, cystoscopy showed a good deal of cystitis, a neoplasm to the left of the trigone, and what I thought looked like tubercles scattered over the bladder. Although I was not aware of it at the time, these were really the vesicles of cystitis cystica. He had been in a sanatorium for some months after a spontaneous pneumothorax in 1933. No tubercle bacilli were found in the urine and the pyelogram was normal except for some dilatation of the ureters. At the first-stage operation on Jan. 13, 1947, there was thickening of the bladder wall over the site of the tumour, but operation was considered to be possible. The second stage and cystectomy were carried out on Feb. 2. The pathological report was: "This bladder exhibits cystitis cystica and also carcinoma." In this case, as in the previous one, there were multiple growths. When seen in November, 1948, he was perfectly well and free from symptoms.

Case 5.—A woman aged 63 had a recent history of haematuria and dysuria. On April 25, 1947, cystoscopy showed a large papilloma of the bladder at the right base and several seedling growths round it. A fragment of the growth was sectioned by diathermy, and the report stated: "Fragments suggest papilloma. I see no histological proof of malignancy." There was a good deal of reaction after the diathermy, and when cystoscopy was carried out on May 12 I decided to leave her for another month. At that time I was very suspicious of malignancy, and a further portion, removed by diathermy, was sent for section. The pathological report stated: "The appearances are deemed consistent with a malignant papilloma." At the first-stage operation on Aug. 11, 1947, the bladder seemed quite operable. The second stage and cystectomy were done on Sept. 1. The pathological report was: "The tumour is a well-differentiated transitional-cell carcinoma. The adjacent mucosa shows an active chronic cystitis with early changes of cystitis cystica." In November, 1948, her doctor reported that she was very well and had no complaints.

Case 6.—A woman aged 56 was seen on March 4, 1948. She had a history of carcinoma of the cervix treated with radium three years before. For the past year she had had severe intractable cystitis with haematuria at times. When cystoscoped as an out-patient there was so much pus that the bladder wall could not be seen. She was admitted to hospital, and after a week's treatment was cystoscoped again. There was a large ulcer of the bladder base, which appeared malignant. As her general condition was good and she was getting so much trouble from the cystitis I decided to do an exploratory operation and see if there was any chance of a radical removal. At the first-stage operation on May 18, 1948, a dense mass of scar tissue was seen round the cervix, including both ovaries, and adherent to the rectum behind and the bladder base in front. At the second stage, on June 8, cystectomy and hysterectomy were performed. The operation was very difficult; the only pleasant feature was not having to worry about the lower ureters in doing the complete hysterectomy. Repair of the lower peritoneum was also difficult after such a wide excision, and was no doubt responsible for the unusual degree of abdominal discomfort and distension which the patient had after the second stage. The pathological report stated: "Cervix: large white mass in cervical wall consists of dense and partially hyalinized fibrous tissue. Both ovaries replaced by a compact mass of dense fibrous tissue. Bladder: the transitional epithelium is somewhat heaped up in places but there is no evidence of invasion. The subepithelial tissue is oedematous and there is a considerable amount of round-celled infiltration of the plasma-cell type, the result of chronic irritation." Although no malignant cells were found I think this was at least a precancerous condition. In November, 1948, she was quite well except for attacks of very severe constipation.

Summary

Six cases with malignant or pre-malignant conditions of the bladder are described. In all the cases transplantation of the ureters was carried out by the method of implanting the ureters in continuity, as a first stage, followed by cystectomy. There was no operative mortality.

Medical Memoranda

Cancrum Oris Among African Natives

The classical description of cancrum oris as given by Christian (1938) is that of a rapidly progressive gangrenous stomatitis in a child already debilitated by another disease, usually one of the exanthemata. Varying treatments are advised, but the prognosis is regarded as hopeless, though Thomson and Findlay (1933) state that occasional recovery does take place. Tidy (1939) states that death is almost invariable. All authorities seem agreed that the probable cause is a combination of organisms similar to that found in Vincent's angina—i.e., spirochaetes and fusiform bacilli. The fact is stressed by all writers that cancrum oris is essentially a rare disease, though I have been unable to find any actual incidence figures.

Observations in Africa.—During the years spent as student, house-surgeon, and general practitioner I did not encounter a single case of cancrum oris in Britain, despite the fact that the whole of this period was spent in a highly industrialized area where the children were often poorly nourished and often lived in unhygienic conditions. In contrast, in less than three years in the Serenje district of North Rhodesia we have come across no fewer than five cases. In the years 1945–7 cancrum oris patients constituted 0.7% of admissions. In no case has there been a previous history of a specific illness. It would seem, therefore, that the main aetiological factors responsible for this comparatively high incidence are the bad diet of the African native and his unhygienic mode of life. It is also worthy of note that the probable causal organisms of cancrum oris are similar to those which are almost invariably found in tropical ulcer, a disease that is always present among the people of this district. Of the five cases seen three were fatal. Of the two who recovered one was treated by extensive resection of the gangrenous area, followed by plastic repair; the other was

treated with penicillin, and this case is detailed below. In no instance did the clinical appearance or progress of the disease differ from the usual description.

Penicillin Therapy.—As favourable results were obtained by penicillin therapy in cases of Vincent's angina it seemed natural to hope that similar results might follow the use of penicillin in cases of cancrum oris. The rarity of the disease, however, seems to have made it difficult to procure reliable information. Fish (1946) was unable to quote any cases. However, a very detailed case history has since been published by Shrand (1947). The case history below is published in the hope that it may add to the volume of information regarding the treatment of one of the most terrible of all children's diseases. It is regretted that circumstances made it impossible to produce more than a purely clinical case history.

CASE HISTORY

A female MuLala child aged about 2 years was admitted to Chitambo Hospital from an outlying dispensary on Oct. 3, 1947. On clinical examination a typical early cancrum oris was seen. The angle of the lip was ulcerated and further investigation showed the ulcer extending back on to the gum in the right canine fossa. There was a well-marked area of brawny induration of the right cheek, extending back to the anterior border of the masseter muscle. Temperature 100.4° F. (38° C.). No history of previous illness could be elicited from the parents.

The following day a brother of the above, a male MuLala child of about 4 years, was admitted with a very advanced cancrum oris. The lips, nose, and most of the right cheek had disappeared and been replaced by a single large sloughing ulcer. Temperature 98.4° F. (36.9° C.). This patient was obviously moribund, and died within twenty-four hours of admission. The virulence of the disease process may be judged from the statement of the parents that the first sign of disease in the boy had occurred only five days previously and in the girl three days previously.

In the case of the female child palliative treatment was adopted. The ulcer was swabbed four-hourly with a strong solution of potassium permanganate, and an attempt was made to maintain the child's resistance by feeding it on thin gruel. Despite these measures the ulceration continued to progress. On Oct. 10 a supply of penicillin became available and treatment with it was instituted, 10,000 units in aqueous solution being administered intramuscularly every three hours. The swabbing with potassium permanganate was continued. After the third injection treatment was interrupted for twelve hours owing to objection from the parents for superstitious reasons. Injections were then resumed, and were continued until 500,000 units had been given.

Results were apparent after twenty-four hours. The brawny induration of the cheek began to soften and the line of demarcation became much less apparent to palpation. After thirty-six hours the sloughs of the ulcerated area began to separate, leaving a granulating surface. After three days of treatment all signs of infiltration of the surrounding tissues had vanished and the ulcer presented a clean and obviously healing surface. Recovery was uninterrupted, and the child was discharged on Oct. 27.

COMMENT

The above case history is interesting in that it records two cases in one family at the same time. There may have been a common source of infection, but it is more probable that the male child, with a highly virulent disease, infected the other. This may indicate a degree of infectivity that does not seem to have been stressed in the literature. This case also indicates that cancrum oris should join the group of conditions classed as highly responsive to penicillin therapy. It was astonishing to see a condition so notoriously fatal, and which had already killed one member of the family, respond so rapidly to penicillin, supported only by the simplest of local measures.

DONALD MACKAY, M.B., Ch.B.Glas.,
Medical Officer, Chitambo Mission Hospital,
N. Rhodesia.

REFERENCES

- Christian, H. A. (1938). In *Osler's Principles and Practice of Medicine*, 13th ed., p. 563. Appleton-Century Co., London.
Fish, E. W. (1946). In *Fleming's Penicillin*, p. 328. Butterworth and Co., London.
Shrand, H. (1947). *Clin. Proc.*, 6, 197.
Thomson, J., and Findlay, L. (1933). *Clinical Study and Treatment of Sick Children*, 5th ed., p. 107. Oliver and Boyd, London.
Tidy, H. L. (1939). *Synopsis of Medicine*, 7th ed., p. 388. Wright, Bristol.

On St. Thomas's Day, Dec. 21, Major-General R. J. Blackham, A.M.S.(ret.), and Dr. Arthur Westerman were re-elected members of the Court of Common Council, Corporation of London. General Blackham was for many years the only representative of the medical profession on the Common Council until 1941, when he was joined by Dr. Westerman, the medical officer of the Charterhouse.