adults. The foregoing observations are comparable to those reported by Williams (1946) in a group of the same number and of similar occupation.

Of the group of 50 persons, 6 (12%) were carriers somewhere on their persons of strains of *Staph. pyogenes* resistant to penicillin. This comprises nearly one in five, or 19.4%, of the 31 persons who were carriers.

These figures are disturbingly high, although not perhaps unexpected in view of the apparently increasing incidence of penicillin-resistant strains in human infections. We are, however, not in a position to assess whether there has been an increase in the carrier rate of resistant strains comparable to that found in the incidence of strains isolated from infections, for we have not been able to discover any published work in this connexion. Moss *et al.* (1948), who were endeavouring during 1946 to abolish nasal carriage of *Staph. pyogenes* by the intranasal administration of penicillin to 21 patients who were persistent nasal carriers, encountered one case which yielded a penicillin-resistant strain and one case which yielded a partially resistant strain during the course of treatment. Neither of these strains, however, was able to produce penicillinase.

We are able to confirm the findings of others (Kirby, 1944; Bondi and Dietz, 1945; Gots, 1945; Barber, 1947a, 1947b) that these naturally occurring resistant strains are able to inactivate penicillin.

Summary

Swabs from the nose, throat, saliva, and six skin sites of 50 healthy men showed a carrier rate of 62% for coagulase-positive staphylococci.

Examination of the 83 coagulase-positive strains isolated showed that 15 (18%) penicillin-resistant strains were being carried by six persons (12%).

Among the 31 carriers of coagulase-positive staphylococci the carrier rate for resistant strains was thus 19.4%.

The resistant strains were all able to inactivate penicillin.

The significance of the findings is discussed.

Our thanks are due to Professor R. Hare for his valuable advice and criticism, and to the various medical students and laboratory workers of St. Thomas's Hospital Medical School for their co-operation in this survey.

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The Scientific Film Association has issued a useful pamphlet entitled "On Organizing Medical Film Programmes" (price 1s. from the Association, 34, Soho Square, London, W.1). Notes on such practical details as how to arrange the chairs, making sure that the fuses are readily accessible, providing a firm table for the projector, and choosing colour or monochrome films are included, and there is a short summary of the law in relation to showing films.

INFECTED HANDS TREATED WITH SYSTEMIC PENICILLIN

BY

GORDON A. BARCLAY, F.R.C.S.

Formerly Demonstrator of Minor Surgery,
Out-patient Department, London Hospital

In an attempt to assess the value of systemic treatment penicillin was given as a routine to all out-patients attending the Infected Hands Clinic at the London Hospital from November, 1946, to January, 1948.

Method

Systemic Penicillin.—One intramuscular injection of penicillin, 200,000 units in aqueous solution (100,000 units per ml.), was given each day. The only variation in dosage was a reduction to 100,000 units in small children and a rise to 300,000 units for the first two or three days of a severe infection with systemic reaction.

Local Dressings.—Penicillin cream (500 units per gramme in an emulsifying wax and castor-oil base) was applied. Glycerin and magnesium sulphate paste was also used extensively in the presence of slough and during the course of systemic penicillin, local chemotherapy being of little value in the presence of necrotic tissue. Repeated saline or antiseptic baths were never used, but occasionally a hypertonic saline bath enabled one to remove a dry adherent dressing, drain, or scab under which pus was collecting. The drains were sterile ribbon gauze dipped in penicillin cream, which achieved the effect of local penicillin with the minimum of difficulty. Splints were never used except in cases of arthritis or tenosynovitis, because it was felt that the bulky dressing applied after incision, combined with a sling, gave adequate rest for the first 48 hours, and that after this time active movements were desirable. Dressings were done on an average every second day.

Physiotherapy.—No short-wave diathermy or dry heat was given. The great majority of patients did not attend the physiotherapy department. All cases with much sloughing of the pulp or osteomyelitis attended a class for finger exercises and occupational therapy.

Incision.—General anaesthesia—gas, oxygen, with occasionally "trilene"—was used, and in many cases an avascular field was ensured by a rubber tubing tourniquet round the base of the finger. Local nerve-block with procaine was employed occasionally. Ethyl chloride spray was not used.

The selection of alternate cases as controls being impracticable, the records of the previous six months are presented for comparison, as well as those of six months in 1944. The types of infection are dealt with below.

I. Paronychia

Surgery.—In early cases a unilateral incision was made in the angle of the nail fold. Usually the incision was bilateral, raising a dorsal flap and removing part or all of the nail according to the extent of the infection. A drain was left under the flap for 48 hours.

The results of treatment with penicillin are given in Table I.

Conservative Treatment.—For 12 out of 134 cases no incision was necessary, inflammation resolving with local heat and penicillin. The average length of history was 3.3 days (10 cases).

Operative Treatment.—Usually pus had already formed when the case was first seen. Incision was then necessary. A preliminary review of cases after 50 to 60 patients had

TABLE I.—*Paronychia*

Series	No. of Cases	Systemic Penicillin No. of Days Given	History in Days	I.H. Interval*			A.D. Interval†		
				No. of Cases	Mean in Days	Standard Deviation	No. of Cases	Mean in Days	Standard Deviation
I. 1944. Propamide dressing	20	—	—	20	16.45	± 16.52			
II. 1946. Local penicillin in most cases ..	49	—	—	49	12.57	± 6.91			
III. 1946-7. Local penicillin in all cases ..	40	—	4.13	39	10.79	± 5.08	39	15.25	± 6.02
IV. 1946-7. Systemic penicillin	134	4.44	4.98	125	8.68	± 3.86	122	12.72	± 5.35

* Day of incision until formation of dry scab without discharge.

† Day of admission until day of discharge with full epithelization and full movements.

TABLE II.—*Terminal-pulp Infection*

Group	Period	No. of Cases	Systemic Penicillin No. of Days Given	History in Days	I.H. Interval			I.E. Interval†			A.D. Interval		
					No. of Cases	Mean in Days	Standard Deviation	No. of Cases	Mean in Days	Standard Deviation	No. of Cases	Mean in Days	Standard Deviation
1	1944	15	—	—	15	21.1	± 14.6*						
2	1946	20	—	—	20	13.5	± 7.47*						
3	1947	83	6.56	4.27	83	11.57	± 7.03	57	16.85	± 8.71	81	17.43	± 9.67
4a	1947. Under 30 years	51		3.70	51	10.1	± 6.23				46	15.67	± 8.83
4b	1947. 30 years and over	40		5.89	34	13.22	± 7.72				29	20.6	± 11.1
5a	1947. History 4-7 days inclusive	38			39	13.2	± 7.45				38	20.6	± 10.4
5b	1947. History 3 days and less	26			27	9.62	± 6.17				24	13.7	± 7.25
6	1947. Delayed incision	22		3.0	22	8.09	± 5.18*	16	14.88	± 6.15*	19	14.41	± 5.94*
7	1947. Diabetes	4		9.0	4	23.75	± 15.34*	4	33.5	± 15.34*	4	41.5	± 15.28*
8	1947. Osteomyelitis	19		9.54	19	45.1	± 16.98*	13	60.9	± 23.3*	13	74.4	± 26.2*
9a	1947. Osteomyelitis: under 14 days' penicillin ..	10	8.21	10	10	53.8	± 16.88*						
9b	1947. Osteomyelitis: over 14 days' penicillin ..	9	20.1	9	9	35.3	± 6.33*						

* Standard deviation for small series of cases.

† Day of incision till full epithelization with separation of all crusts and scabs.

been discharged showed little difference in the results in all but severe cases. It was therefore decided to omit systemic penicillin from the treatment of mild cases (Series III); these are compared with a larger group containing all cases treated with systemic penicillin, weighted by a larger proportion of severe cases (Series IV). Series III gave both longer incision-drying (I.H.) and admission-discharge (A.D.) intervals, which in the case of the I.H. interval would have occurred only 1 in 100 times, and in the case of the A.D. interval 1 in 33 times, through chance. Thus the milder cases, instead of showing shorter intervals as would be expected, gave slightly longer intervals. In comparing the "controls" with cases treated with systemic penicillin the difference is statistically significant for Series II, but though the difference is larger in Series I the greater variation gives a 1 in 25 possibility of the difference being due to chance.

II. Uncomplicated Terminal-pulp Infection

The results of the penicillin treatment of this series are given in Table II.

Surgery.—Hockey-stick or bilateral through-and-through incisions were made with division of all longitudinal fibrous septa in each case. The horseshoe or crocodile-mouth incision was not used, the functional end-result being poor.

Conservative Treatment.—In cases with a short history of pain (1-4 days) and only one or two nights' loss of sleep, and where on examination it was thought that pus had not yet formed, incision was delayed, systemic penicillin, kaolin poultices, and some analgesic being the only treatment. To these cases must be added a number in which there was some contraindication to immediate operation. Twenty-seven cases were treated in this way. Five of these resolved without pus formation and 22 had incision one or more days later (mean 1.64 days). The incision was often limited to part of the terminal pulp without division of all fibrous septa, as in many cases a well-marked localization had occurred within the terminal pulp and general swelling and tension of the pulp had subsided. As can be seen from Table II, all the intervals measured are shorter than in the main penicillin-treated group. The difference of 3.48 days

in the I.H. interval would have occurred only 1 in 100 times as a matter of chance; the significance of the other differences is less than this. The mean length of history in this group (No. 6) was only 3.0 days as compared with 4.27 for all cases (Group 3). This shorter history may be partly responsible for the quicker healing, but at least it seems clear that delayed incision did not delay healing and did not result in complications causing prolonged disability.

Operative Treatment.—Table II shows that penicillin-treated cases for 1947 had the shortest period of disability. The difference between the 1947 series and that of 1946 is not statistically significant, but the difference between 1944 and 1947 would occur only 1 in 100 times through chance.

Age.—Cases fell into two main groups, those under 30 and those 30 years and over. As can be seen from Table II, these two groups show a difference of 2.19 days in length of history; this is statistically significant. The difference in the I.H. interval (3.12 days) would occur only 1 in 20 times through chance and the A.D. interval (4.93 days) 1 in 15 times through chance.

Length of History.—Arranging cases into two groups—those with a history of three days or less and those with a history of four to seven days—there is an increase in disability in the latter group of 6.9 days in the A.D. interval, which is statistically significant. Those cases with more than seven days' history gave much longer periods of disability—23 days for the I.H. interval and 30 days for the A.D. interval. It seems clear that the younger age groups have a shorter history and a shorter period of disability, the shorter history being at least one if not the main factor in lessening the time of disability.

Final Movements and Functional Result.—In only one case was there limitation of movement on discharge; this was only 10 degrees limitation of flexion. Some loss of function due to paraesthesia or anaesthesia of the scar and destruction of the pulp in cases of gross sloughing was, however, relatively common. Paraesthesia tended to disappear rapidly, especially after compensation.

Incidence of Complications.—No case of arthritis, osteomyelitis, or tenosynovitis arose during penicillin treatment except one possible case mentioned under osteomyelitis.

III. Terminal-pulp Infection with Osteomyelitis of the Terminal Phalanx

Diagnosis.—Bony infection may be immediately demonstrable by radiography in late cases, or the diagnosis may be one of suspicion only, confirmed later by radiological evidence. The three factors of Bolton *et al.* (1947)—length of history, amount of tissue necrosis, and previous inadequate incision—are helpful in diagnosis. To these can be added age of patient and the typical bulbous appearance of the terminal phalanx.

Length of History.—In 78 uncomplicated cases with a mean of 4.27 days' history only three gave a history of eight days or more, while of 19 cases of osteomyelitis with a mean of 9.54 days' history only three gave a history under a week and five gave exactly a week's history. Thus a short history does not exclude bony infection, nor does a long history necessitate it.

Age of Patient.—As has been shown in uncomplicated cases, patients under 30 have shorter histories and a shorter disability. In cases of osteomyelitis only two out of 19 (10.5%) were under 30, while 59.5% were under 30 in the uncomplicated cases. In this series only those showing radiological signs of osteomyelitis are included: cases of suspected osteomyelitis never proved radiologically are included under uncomplicated cases.

Surgery.—This was identical with that of uncomplicated cases. Sequestrectomy was never performed until definite radiological evidence was at hand, unless a sequestrum was seen lying free at the primary operation for incision of the pulp.

Cases (see Table II) are divided into two groups: the first 10 cases (Group 9a) received penicillin for less than 14 days

(mean 8.2 days), the second group of 9 (Group 9b) received it for more than 14 days (mean 20.1 days). This change was due to the realization that a week of systemic penicillin was not controlling cases satisfactorily. Though the numbers are small the difference of 18.5 days in the I.H. interval is statistically significant and the two groups appear to be clinically of similar severity, with a mean history of 10 and 9 days and a mean age of 43 and 40 years respectively.

Progressive Osteitis.—This did not occur after the administration of systemic penicillin except in one case. This case is not included in the figures as it received much of its treatment at another hospital. The extension of the bony infection and involvement of the distal interphalangeal joint occurred a few days after cessation of the initial seven days' systemic penicillin; this should have been avoided if penicillin had been continued for a longer period.

Sequestrum Formation.—In Group 9a one large sequestrum was removed at primary operation and four other cases had small sequestra removed later. In Group 9b no sequestrectomy was necessary, minute pieces of dead bone being extruded in the dressings, while cases in which there was gross radiological disorganization of the terminal phalanx, with separation of the bone into two or more separate pieces, resolved without sequestrum formation, a somewhat deformed phalanx re-forming.

Tenosynovitis.—One probable case was seen in which the middle pulp space was also affected and bilateral incision of the terminal and middle pulp was necessary. Osteomyelitis of the terminal phalanx was present, but there was no radiological evidence of arthritis. Final movement at the terminal interphalangeal joint was only 25 degrees flexion: it is suggested that the diminished

TABLE III

	No. of Cases	Systemic Penicillin No. of Days Given	History No. of Days	I.H. Interval			A.D. Interval		
				No. of Cases	Mean in Days	Standard Deviation	No. of Cases	Mean in Days	Standard Deviation
Terminal-pulp infection	83	6-56	4-27	83	11-57	$\pm 7-03$	81	17-43	$\pm 9-67$
Palmar-subcutaneous infection of fingers .. .	43	5-54	4-41	40	11-94	$\pm 7-19$	41	15-02	$\pm 7-4$
Web-space infection	32	6-7	4-62	29	13-34	$\pm 8-16^*$	31	16-11	$\pm 8-03^*$
Subaponeurotic infection	15	6-07	5-21	15	12-51	$\pm 6-81^*$	14	19-77	$\pm 8-8^*$
Thenar-space infection	6	5-1		2	11		6	13-17	$\pm 8-34^*$
Dorsal infections of fingers	34						34	17-44	

* Standard deviation for small series of cases.

TABLE IV

Infection	Penicillin	Days of Incapacity							
		Incision Dry			Incision Closed Not Moist	Incision Epithelized		Incision Epithelized and Full Function	
		Barclay	Floreys and Williams (1944)	Bolton <i>et al.</i> (1947)	Curr (1945)	Barclay	Floreys and Williams (1944)	Barclay	Webster (1947)
Paronychia {	None Local Systemic	16.5 10.8 8.7	15.5 7.7					15.3 12.7	14 17.1
Terminal pulp {	None Local Systemic	21.1 13.5 11.6	20.7 10.8	17 17	18 23	16.9	29.7 21.7	17.4	15.4 18.9
Terminal pulp, with osteomyelitis terminal phalanx {	None Local Systemic	a. 53.8 b. 35.3			37 36			74.4	
Web {	None Local Systemic	13.3			16 13		34.2 18.8	16.1	
Palmar space {	None Local Systemic				23 26				14 15.7
Thenar space {	None Local Systemic	11						13.2	11 18.1

movement was due to some tendon damage with adhesion formation.

Final Result

Movements.—These returned to normal except in the case complicated by arthritis, the case mentioned above as probable tenosynovitis, one with 5 degrees limitation of flexion, and another with 20 degrees limitation. Thus, in general, partial destruction of the phalanx did not limit final movements.

Loss of Soft Tissue and Scarring.—Greater disability resulted from this cause, gross sloughing of soft tissues and multiple incision contributing. Under systemic penicillin treatment the absence of long-continued discharge and its resultant fibrosis and the reduction in the number of sequestrectomies improved the result, but there did not seem to be any regeneration of the soft tissues comparable with the reappearance of the bony phalanx.

IV. Palmar Subcutaneous Infections of the Proximal and Middle Phalanges

Four cases out of 40 subsided without incision. The periods of disability as shown in Table III do not differ significantly from those in uncomplicated terminal-pulp infections.

V. Dorsal Infections of the Fingers

Under this heading are included all dorsal infections except paronychia. Incision was necessary in only six cases, where it was limited to the release of pus under tension when still present after one or two days' treatment with systemic penicillin.

VI. Space Infections (Web, Subaponeurotic, and Thenar)

The numbers seen in each group were small. The results do not show much improvement on non-penicillin-treated cases in previous periods, with the following exceptions: no case suitable for conservative treatment was seen in the subaponeurotic group, but out of 32 web-space infections three resolved without incision, as did four out of six thenar-space infections.

VII. Acute Tenosynovitis

A single daily dose of 200,000 units of penicillin is not sufficient to abort or treat all cases of tenosynovitis (see Case 2); once tenosynovitis was diagnosed the patient was admitted to hospital for more frequent injections of penicillin. Immobilization of the affected finger by a plaster slab was carried out for one week.

Primary Tenosynovitis

Case 1.—This patient had a 24-hours history of a penetrating wound of the fifth finger. Examination revealed tenosynovitis of the fifth finger and ulnar bursitis. As an in-patient he was given systemic penicillin, and a small incision made along the ulnar border of the sheath at the base of the fifth finger released seropurulent fluid. The wound was sutured on the fifth day. Haemolytic streptococcus and *Bact. coli* were obtained from the puncture wound and haemolytic streptococcus from the sheath (*Bact. coli* was penicillin-resistant). The patient defaulted while being followed up as an out-patient, but when last seen he had full movement with the exception of 10 degrees limitation of flexion of the fifth finger and slight loss of gripping power.

Case 2.—Treated as an out-patient with systemic penicillin, 200,000 units daily, for a penetrating wound of the base of the third finger. Signs of tenosynovitis gradually appeared, but were not definite until the fourth day. The patient was admitted for intensive penicillin, and an incision was made to relieve tension in the proximal end of the sheath. Seropurulent fluid showing pus cells but sterile on culture was found. Final result: 5 degrees limitation of full flexion with slight loss of

power. The patient thought there might be slight loss of function, but compensation had not been decided.

Case 3.—Attended as out-patient, with a history of a splinter in the proximal pulp of the third finger. On examination some cellulitis of the proximal pulp was seen; this subsided after two days' treatment with penicillin. The patient defaulted after the second day, to return after one month with acute tenosynovitis of the third sheath. Systemic penicillin therapy as an in-patient and immobilization without incision resulted in cure with full function but 5 degrees limitation of full flexion.

Case 4.—Puncture wound of the base of the third finger with signs of tenosynovitis, resolved with in-patient systemic penicillin therapy. Final result: full function.

Secondary Tenosynovitis

An early case resolved completely, while one late case resulted in sloughing of the distal sheath and adhesions of the tendon to the overlying scar with negligible movement at the distal interphalangeal joint and 10 degrees limitation of flexion at the proximal joint. A third case is mentioned under "Osteomyelitis."

VIII. Acute Arthritis

From three cases seen it was realized that arthritis may occur before or after penicillin treatment without marked physical signs, and that even if arthritis does occur a useful joint should be obtained with only partial loss of movement provided the cartilage has not been too grossly damaged. In one case cartilage destruction must have been considerable, as half of the distal joint surface was sequestered, but limitation of extension was only 10 degrees and flexion 35 degrees.

General Considerations

Systemic penicillin treatment in the out-patient department has resulted in a big saving in bed space. This is shown by the following figures. General surgical admissions to the London Hospital were 11% higher in 1947 than in 1946, while beds available for septic cases rose from 21 to 28. The out-patient clinic for infected hands also expanded by 64%. However, 37 cases of infected hands were admitted during 14 months of systemic penicillin treatment in the out-patient department, as compared with 78 in the previous 14 months, a drop of 52%. Of the 37 cases, four or five were admitted unnecessarily according to present standards. The reduction was mainly due to a fall in uncomplicated but severe soft-tissue infections from 49 cases to 13 and of osteomyelitis from nine to three; and two of these three cases were diabetics admitted for stabilization.

The reduction in pain and tissue-swelling brought about by systemic penicillin improved drainage and allowed many patients to continue work uninterruptedly except on the day of incision.

Apart from paronychia, penicillin-sensitive organisms were isolated in all cases except one of osteomyelitis yielding a relatively insensitive *Staph. pyogenes*. Of 94 positive swabs taken from cases of paronychia, 15 grew penicillin-resistant organisms—*Bact. coli* 6, *Proteus* 7; *Ps. pyocyanea*, *H. influenzae*, and a resistant *Staph. pyogenes* one each. These cases took nearly three days longer to heal than the main group, but this is not statistically significant. In seven cases penicillin-resistant organisms alone were isolated. Only three cases showed marked clinical resistance to treatment: two with cultures of *Proteus vulgaris* responded to propamidine cream; one chronic case which had previously received penicillin grew a resistant *Staph. pyogenes* but responded to sulphonamides. Penicillin-resistant organisms did not appear to be secondary invaders, as they were found both in early and in late cases.

Discussion

From an examination of Table IV it will be seen that there is no very startling difference between the non-penicillin- and the penicillin-treated series, but in general the comparison bears out the impression that penicillin shortens the disability, more especially if given systemically, though such a comparison between different papers is not very satisfactory.

Various papers read at the XXIIIrd Medico-Legal Congress in Paris (1946), for cases treated before the general use of penicillin, gave similar periods of disability, such as that of paronychia (13 days' treatment). It was also shown that with advancing age there was increased temporary and permanent incapacity, and that the longer the time before surgical treatment the longer was the period of temporary incapacity; this conclusion applied to infected hands in general and agreed with the results of terminal-pulp infection noted in this paper. However, Bolton *et al.* (1947) found no relation between length of history and disability, but reported increased disability with increased age.

Though the mean period of disability may show only slight diminution with penicillin treatment, it is interesting to see that Curr (1945) and the Medico-Legal Congress report spreading and gangrenous infections. It is in avoidance of these severe infections that systemic penicillin shows the most beneficial results. To prove that such infections are prevented by routine systemic penicillin would need very large numbers of cases. I have, however, seen infection extend along the finger in cases treated by apparently adequate incision but without penicillin, and especially in old and debilitated subjects. These infections have been easily controlled with penicillin in out-patients. The incidence of complications such as osteomyelitis, arthritis, and tenosynovitis is also decreased.

With practice it may be possible to select at first sight all cases that are complicated or appear likely to spread and become complicated, but unless this can be relied upon routine administration of penicillin should be carried out.

Various authors have mentioned conservative treatment, and Webster (1947) concluded that it was impossible to abort a terminal-pulp infection. Experience gained in this series, however, suggests that when the cases are first seen an attempt should be made to decide whether pus is present or not. If present, incision is indicated; if not present, systemic penicillin and local heat may abort or localize the infection. The common practice of applying heat until a finger is "ripe" must be condemned, as once pus has formed delay may result in further destruction of pulp tissues, and if pus has not formed resolution is possible with penicillin. In hospital practice few cases are seen early enough to abort, but in outside practice a larger number of suitable cases should be available.

The method is not advised without full surgical facilities and daily review of cases, for, while pain is often greatly relieved by one or two injections of penicillin, incision may still be necessary.

Summary and Conclusions

Systemic penicillin, 200,000 units in one daily dose, was given as a routine to cases of infected hands in an out-patient department. The results of 380 cases are analysed and compared with those of cases not so treated and with other published results.

This routine did not reduce the period of disability in a marked degree in uncomplicated cases, though there was some definite improvement.

It resulted in the resolution of some early cases without incision and did not increase the disability in cases which had been treated conservatively and which were subsequently incised.

It controlled systemic reaction and spread in severe uncomplicated cases.

It reduced the period of disability and probably the incidence of complicated cases.

It greatly improved the functional end-result in cases of arthritis and tenosynovitis.

It resulted in a considerable saving of in-patient beds, admission of infected hands being reduced by 52% in spite of a much larger out-patient clinic.

It was found in the case of terminal-pulp infection that with increasing age there was a longer history of pain, a longer period of disability, and a greater liability to osteomyelitis.

I wish to acknowledge my indebtedness to Mr. E. C. B. Butler for his encouragement and helpful criticism, to Dr. F. C. O. Valentine for his advice on the bacteriological aspects, and to the authors mentioned for their kind permission to quote their results.

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CHRONIC URETHRAL OBSTRUCTION IN CHILDREN

BY

R. J. LAST, M.B., F.R.C.S.

Lecturer in Anatomy and Anatomical Curator, Royal College of Surgeons of England; Formerly O.C. Abyssinian Medical Unit, British Red Cross Society

Chronic obstruction of the urethra is so much more common in the adult than in the child that, except in very specialized urological practice, experience of the latter is usually very limited. The outlook of the general surgeon is thus inevitably coloured by his experience of adult pathology. Where long-continued obstruction exists in the adult, with production of advanced hydronephrosis, relief of the obstruction can usually do little more than arrest the hydronephrosis. In the child, however, reparative powers are so much more active that a very different picture presents itself. A gross hydronephrosis can recover to such an extent that subsequent pyelography will reveal no abnormality whatever. Furthermore, after as much as two years of overflow incontinence the bladder sphincters can regain their tone and preserve continence instantaneously, as was demonstrated in the majority of the 73 cases which form the basis of this article.

All the patients were Abyssinian boys aged from 8 to 16 who had suffered amputation of penis, scrotum, and testes several years previously, the result of intertribal raids and minor warfare. The boys almost invariably showed other evidence of the attacks they had withstood from their aggressors. Depressed scars of the scalp, missing fingers, and deep scars of the forearms were frequent. The mutilation is carried out by grasping the external genitalia, pulling out the mass of tissue, and slashing it through with the angled sword with which many of the Abyssinians are armed. One would expect that the immediate mortality from such injuries would be high, and this impression was confirmed by the accounts of native witnesses. Gross infection of the raw surface occurs, and this accounts for the extreme degree of scarring, which led ultimately to chronic urethral obstruction in the cases under review.