

Section of Physical Medicine

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DISCUSSION ON HYDROCORTISONE

Dr. Hugh Burt (Director, Dept. of Physical Medicine, University College Hospital, London):

In this discussion we shall deal only with the effects of local injection of hydrocortisone into and around the joint; we shall make no reference to the effects of hydrocortisone given orally because (1) we have no personal experience with this method of administration, and (2) it may be assumed that its systemic antirheumatic effect is similar to that of cortisone.

Hydrocortisone

Hydrocortisone (17-hydroxycorticosterone) was isolated from the adrenal glands by Kendall in 1936, and also by Reichstein in the same year. It was not available in quantity until the end of 1950, by which time it was being synthesized by the firm of Merck & Co.

It is probable that hydrocortisone is a more important adrenal steroid than cortisone. This view is held by a number of different workers as the result of their investigations. Mason (1950) found that after injection of ACTH into 5 patients with rheumatoid arthritis hydrocortisone, *but not cortisone*, was recovered from the urine of 4 of them. Pincus, Hechter and Zaffaroni (1951) found that when they perfused isolated suprarenal glands with blood containing ACTH the amount of hydrocortisone isolated from the suprarenal veins was between ten and thirty times as great as the amount of cortisone.

The greater efficacy of hydrocortisone as compared with cortisone when given by local injection, which will be discussed later, is probably further evidence that hydrocortisone is the more important antirheumatic steroid of the two.

Action of Adrenal Steroids on Joint Disease

If sufficient doses of ACTH by intramuscular injection or of cortisone (intramuscularly or by mouth) are given to patients with rheumatoid arthritis, significant changes take place in the affected joints within a few days. The joint temperature decreases (Hollander *et al.*, 1951), and in the synovial fluid the cell count falls (due almost entirely to a decrease in the number of polymorphonuclear leucocytes), the viscosity rises, and the quality of the mucin improves (Duff *et al.*, 1951).

Identical effects are produced by repeated daily intra-articular injections of cortisone, or single doses of hydrocortisone.

These results support the hypothesis that adrenocortical steroids exert their favourable effect on the joints of rheumatoid arthritis at the connective-tissue level. If this is so, then, apart from the intrinsic disadvantages of repeated intra-articular injections, the injection of hormones into joints for their local anti-inflammatory effect is a logical procedure.

Freyberg was the first to inject a steroid intra-articularly (Freyberg *et al.*, 1951). He used cortisone and noted *in some cases* a favourable local response. In other cases, however, the joint became worse after the injection. This has been the experience of most who have injected cortisone into joints, and as at best its effects are short-lived it has been abandoned as a therapeutic procedure.

Hollander and his colleagues in Philadelphia first used hydrocortisone on a large scale for intra-articular injections in January 1951 (Hollander *et al.*, 1951). Since 1952 these workers have published numerous reports on hundreds of patients who have received many thousands of intra-articular injections of hydrocortisone. Their results appear to have been strikingly good. I have consulted these papers by Hollander and his colleagues a great deal in the preparation of this lecture.

Difference between Intra-articular Cortisone and Hydrocortisone

An interesting study was carried out in New York in 1952 by Ziff and his colleagues (Ziff *et al.*, 1952). Its objects were: (1) to investigate the effect of intra-articular cortisone and hydrocortisone, and (2) to compare the effects of the two compounds one with the other and with a series of control saline injections. They investigated 10 patients with arthritis of the knee (7 with bilateral effusions). First they noted any subjective improvement. Secondly they made objective records of changes in joint circumference, alterations in the inflammatory signs (redness and heat), and changes in mobility. Lastly they investigated

the synovial fluid, noting changes in viscosity, alterations in the cell count, and variations in the amino-tripeptidase concentration in the fluid. Amino-tripeptidase is an enzyme produced by breaking-down leucocytes and is, the authors believe, a reliable index of the degree of inflammation in the joint. The results in these 10 patients were as follows:

None of the 22 injections of the control substance (saline) produced any objective improvement, though after 3 (14%) of them there were significant changes in the synovial fluid.

With cortisone 4 out of 13 injections (31%) produced clinical improvement, but only 3 (23%) produced improvement in the synovial fluid.

On the other hand, of the 20 hydrocortisone injections 16 (80%) were followed by significant objective improvement, and 19 (95%) by significant changes towards normal in the properties of the synovial fluid.

As a result of this investigation Ziff and his colleagues concluded: (1) that the distinct superiority of intra-articular hydrocortisone over cortisone suggests that hydrocortisone or a metabolic derivative of it may be the active substance which induces the suppression of tissue reaction; (2) that cortisone given systemically is reduced either to hydrocortisone or to another active steroid; and (3) that the lack of significant local action on the part of cortisone, in the doses used, suggests that this reduction to a biologically active metabolite does not occur to a significant extent in synovial tissue.

Hollander puts forward another explanation—namely, that the difference between the two hormones lies in the fact that hydrocortisone is seven times less soluble than cortisone in blood plasma, and therefore, presumably, in synovial fluid. In other words, the cells of the synovial membrane can take up and retain hydrocortisone much longer than they retain cortisone.

Results with Intra-articular Hydrocortisone

It was not until March 1954 that hydrocortisone became available to us at University College Hospital. Our experiences with this substance are, therefore, necessarily limited. In view of this I think it best to discuss the results obtained by the American observers before describing our own.

Rheumatoid arthritis.—Hollander in the eighteen months between January 1951 and June 1952 gave 2,325 injections to 249 patients with rheumatoid arthritis (Hollander, 1953). All but 133 (5.7%) injections were considered successful, his definition of a successful injection being one that produced unequivocal improvement in symptoms and signs which lasted a minimum of three days. His most striking successes were in the knee-joint, where of 1,758 injections there were only 43 (2.4%) failures. The highest proportions of failures were in the temporo-mandibular and wrist joints (60% and 32% respectively).

The results obtained in the Department of Physical Medicine at University College Hospital in a very much smaller series of cases correspond closely to those of Hollander, as Table I (compiled by Dr. W. D. Fletcher) shows.

TABLE I.—RESULTS AFTER ONE WEEK OF 72 INTRA-ARTICULAR INJECTIONS IN 17 PATIENTS WITH RHEUMATOID ARTHRITIS

	Grade 1	Grade 2	Grade 3	Total
Knees	2	27	0	29
Elbows	0	16	3	19
Wrists	1	0	0	1
Interphalangeal joints ..	4	11	0	15
Shoulder	1	0	0	1
Hip	0	0	1	1
Bursæ, ganglia, tendon sheaths	3	2	1	6
Total	11	56	5	72

The results are assessed according to three grades; Grade 1 denoting complete relief of symptoms one week after injection; Grade 2 definite symptomatic relief justifying maintenance injections; Grade 3 no or only slight symptomatic relief, not justifying the risk of repeated injections.

Of the 72 injections performed on patients with rheumatoid arthritis, 11 produced complete symptomatic relief and 56 definite symptomatic relief; only 5 injections were considered failures. It should be noted that the knees were aspirated as completely as possible before each injection. Several observers, among them Freyberg (1952), have noted that the success of the injection varies according to whether or not the joint has been completely aspirated. One wonders, therefore, whether some of the benefit after hydrocortisone is in fact due to the aspiration.

A small but interesting group of cases were those classified under the heading "Bursæ, ganglia, tendon sheaths"; in 5 out of 6 instances hydrocortisone injection was markedly or completely successful.

Osteoarthritis.—In Hollander's series of patients with osteoarthritis treated by hydrocortisone there were only 13% failures in a series of 1,211 injections, the most favourable results being obtained in the knee-joint (90% success in over 1,000 injections); the highest proportion of failures was in the hip (53% in 77 injections).

Our own experience at U.C.H. has been limited to a few patients with osteoarthritis of the small joints of the hands and feet. The results in 3 patients were as follows:

(1) Carpo-metacarpal joint of thumb: 3 injections resulted in complete relief of symptoms for many weeks; 2 injections gave considerable relief.

(2) Interphalangeal joint of ring finger: 1 injection was followed by considerable symptomatic improvement which lasted for six months.

(3) Metatarso-phalangeal joint of big toe: 1 injection was followed by complete relief of symptoms.

Though this series is admittedly small, it suggests that treatment of osteoarthritis of the small joints of the hands and feet with hydrocortisone should be further studied, particularly as arthritis of these joints is notoriously resistant to other forms of therapy.

Extra-articular Sources of Pain in Arthritis of the Knee

There is one more group of cases that I wish to discuss briefly. Often in rheumatoid arthritis of the knee much of the pain arises from extra-articular structures. Not infrequently this pain can be controlled by procaine injections repeated at approximately fortnightly intervals.

A combination of hydrocortisone and procaine has in my experience had two results:

(1) Greater relief of pain resulted than when procaine alone was used.

(2) The period of relief has been doubled or trebled (lasting in some cases up to six weeks).

CONCLUSIONS

(1) In rheumatoid arthritis intra-articular hydrocortisone has been shown to have a striking local anti-inflammatory effect in a large proportion of cases. This effect, however, is of short duration, and the question arises whether the benefit obtained justifies the trauma and other possible complications of repeated joint injection in a disease which may well remain active for years.

(2) The indications for the use of hydrocortisone in rheumatoid arthritis at the present time seem to be as follows:

(a) Where only one or two peripheral joints are severely involved, and particularly where this localized disease is seriously interfering with the patient's activities.

(b) In cases where general systemic remedies such as gold, cortisone, or phenylbutazone (Butazolidin) are contraindicated.

(c) As an aid to physical methods of treatment where suppression of the inflammatory reaction in some cases appears to hasten the effects of manipulation, splinting, &c.

(3) In osteoarthritis of the easily accessible peripheral joints the local use of hydrocortisone seems to be justified, as the effects, if produced at all, are often long-lasting. Hydrocortisone seems to be particularly indicated for certain joints which are notoriously resistant to other forms of treatment, such as the carpo-metacarpal and the metacarpo-phalangeal joints of the thumb and the metatarso-phalangeal joint of the big toe.

(4) Hydrocortisone appears to enhance the effect of procaine injection in those cases of arthritis of the knee in which much of the pain arises from extra-articular structures.

(5) Finally, it must be fully realized that hydrocortisone is still under trial, and in systemic diseases such as the collagenoses it can never replace general medical treatment.

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Dr. Donald Wilson: I would like to point out that I am not reporting the results of a clinical trial. Authors have reported clinical trials of this preparation planned on different lines and if I had been reporting a clinical trial I would have planned these injections in a different way. The object of the use of hydrocortisone in these patients was to relieve pain and improve the range of movement of the affected joint. If other observations were made during the injections and as a result of the injections, these are isolated observations and any deductions that can be made should only be regarded as a pointer to the way rather than the way itself. In the cases quoted, most have had their articular disability for a long time since I did not regard hydrocortisone as the drug of choice in the early stages of either rheumatoid or osteoarthritis. In rheumatoid arthritis remission of the disease may be produced by several forms of systemic treatment and by local physical treatment. Only when the joint has failed to respond to the general and local treatment has hydrocortisone been considered. In osteoarthritis the same approach has been used. In the cases quoted, physical treatment of the affected joints has been given and continued during the injections of hydrocortisone. Hydrocortisone was given when the joint had failed to respond to other methods of treatment.

In spite of my cautious approach to the need for hydrocortisone in these cases—this caution being engendered by the belief that activation of a tuberculous joint, production of a pyogenic arthritis and perforation of a peptic ulcer may be more serious than the disability at present existing—I have given the great majority of these injections to Out-patients. I have used a facial mask if “colds” have been prevalent but I have not used gloves; the skin of the patient has been cleaned by spirit and I have taken care to dry the skin by means of sterile gauze after the application of spirit. The syringes and needles are autoclaved. I mention these points because in the U.S.A. there has been controversy on this subject, some authors advocating strongly that intra-articular injection is dangerous without full operating theatre sterility and others maintain that simple but adequate sterility such as can be found in Out-patients is enough. Hollander is of the latter school and if one can give and supervise over 7,000 intra-articular injections with a very small morbidity rate, then that opinion is worth consideration. In the past eighteen months I have given over 250 injections of hydrocortisone into the knee-joints and the region of the hips. To the best of my knowledge there have been only 3 untoward occurrences. In one case two weeks after the injection, the patient was pushed down in a scramble for a late bus and he sustained a hæmarthrosis. A woman who had received an injection for osteoarthritis of the knee with a large effusion was walking briskly, slipped and fell—a hæmarthrosis resulted. In a third patient, again with osteoarthritis, following the injection there was complete relief of pain and full range of movement, but at the end of four days he impacted a loose body in the affected joint.

I was tempted to compare the results of injection with hydrocortisone with those of procaine. This task I found too difficult although the procaine injections had been done in the recent past and details were available but the conditions under which the injections were given were different; the criteria of improvement were the same and clinical details were not missing but I felt that the individual assessment was probably different. For these reasons I felt that the comparison would be unfair.

The improvement in the range of movement was estimated by measurement when the patient was non-weight bearing. An improvement of 0–5 degrees can be regarded as showing in reality no improvement. 5–20 degrees can be regarded as definite improvement. Full range of movement implies that the patient was able to put the affected joint through the full range of movement when non-weight bearing. In certain cases the limitation of movement before injection might be slightly less than 10 degrees. The assessment of pain was made on weight bearing: the ability of the patient to take the body weight on the affected leg.

TABLE I.—RHEUMATOID ARTHRITIS OF KNEES

Number of knees injected 44		
Range of movement improved by		
0–5 degrees	5–20 degrees	Full
8	12	24
PAIN		
No improvement	Improvement	Free from pain
7	19	18

Table I shows the bare results of 76 injections of hydrocortisone into 44 knee-joints. In 24 cases full range of movement was obtained and in 18 cases complete freedom from pain.

TABLE II.—RHEUMATOID ARTHRITIS OF THE HIPs

Number injected 11		
<i>Range of movement improved by</i>		
0-5 degrees	5-20 degrees	Full
3	6	2
PAIN		
No improvement	Improvement	Free from pain
2	7	2

Only 11 hip-joints were injected (Table II). Only 2 showed full range of movement at the end of two months and in only two cases complete freedom from pain obtained.

These results contrast with the relatively good results with injection into the knee-joint. I think, in common with others, that the ease of injection into a knee compared with a hip is the principal cause for the disparity in the results.

TABLE III.—OSTEOARTHRITIS OF KNEES

Number of injections 23		
Number of knees injected 14		
<i>Range of movement improved by</i>		
0-5 degrees	5-20 degrees	Full range of movement
	6	8

In all the 14 cases injected there was a significant improvement in the range of movement (Table III).

TABLE IV.—OSTEOARTHRITIS OF HIPs

Number injected 17		
<i>Range of movement improved by</i>		
0-5 degrees	5-20 degrees	Full
8	6	3
PAIN		
No improvement	Improvement	Free from pain
3	13	1

As in rheumatoid arthritis of the hips the results (Table IV) are less favourable than with a similar condition of the knee-joint.

From these Tables I gained the impression that hydrocortisone is of some value in correcting deformity in joints and procuring relief of pain. Results are more easily assessed in the knee-joint and the injection should be undertaken early in the disability before contraction has taken place in the muscles around the joint. I cannot be certain that a satisfactory result will be obtained at any particular phase. I have seen more than once a poor response to an intra-articular injection of a knee-joint yet an excellent result to an injection of a hip-joint in the same patient.

It is too early to estimate the duration of the results of an intra-articular injection of hydrocortisone. One injection of hydrocortisone may produce improved range of movement from one to six months and even longer.

For what period should the injections of hydrocortisone be given intra-articularly? It is probable that their main use is in the prevention and assistance of correction in articular deformities and when these results have been achieved then hydrocortisone should be discontinued. Although hydrocortisone has been of value in the alleviation of pain it may be that its real value is in the early stages of an exacerbation of the arthritic disorder when, combined with rest, a dramatic and longstanding relief may be obtained.

Dr. C. E. Quin (Arthur Stanley Institute, Middlesex Hospital, London):

I shall briefly mention the results of local hydrocortisone injection in soft tissue lesions.

Tennis Elbow

Hollander (1953*a*) referred to the successful treatment of tennis elbow in his summary of two years' experience in the use of hydrocortisone locally. Cyriax and Troisier (1953) also reported favourably on this treatment. Murley (1954) treated 19 patients with hydrocortisone and 18 control patients with procaine. After one week the results in the hydrocortisone-treated patients were 14 improved, and after one month, 2 improved and 14 improved greatly.

The figures for the control cases were: at one week, 7 improved, and at one month, 7 improved and 2 improved greatly. Murley concluded that local injection of hydrocortisone causes relief of symptoms in a high proportion of cases of tennis elbow. He added "relapse is common, but this usually responds to a second injection". This has been our experience at the Middlesex Hospital, and Dr. F. A. Binks and I reported relief of symptoms in 27 out of 31 patients, the injection being considered successful if relief of symptoms resulted for at least one week (Quin and Binks, 1954). Freeland and Gribble (1954), treated 7 patients with hydrocortisone and 7 with procaine and found no difference in the results. Both procaine and hydrocortisone produced distinct improvement in half the cases, lasting two to four months. This is certainly a better result than is usually obtained with procaine for the benefit lasts, as a rule, no longer than the duration of the local anaesthesia.

At the Middlesex Hospital we now have a series of 57 cases of tennis elbow treated with hydrocortisone. The duration of symptoms was under two months in 20 patients and under six months in 47 of the 57 patients. The results of treatment assessed at one to three weeks after the injection were as follows: 45 had complete relief or almost complete relief. By almost complete relief I mean they had no symptoms in ordinary everyday activities though aching might occur after heavy work. A reduction in severity of symptoms was claimed by 8 patients and in 4 patients there was no benefit. Relief was obtained with one injection in 41 of the 45 patients who had complete or almost complete relief, but the other 4 required a second injection. Several injections were tried in those experiencing partial relief but without further benefit.

The method of giving the injection is simple. Probably all that is necessary is to inject the hydrocortisone into the most tender area in the region of the lateral epicondyle. I inject procaine first and then ask the patient to grip and to extend the wrist against resistance. There should be no pain when tested in this way, thus supporting the diagnosis of a local soft tissue lesion.

When observed a week after injection, there is no pain on gripping or extension of the wrist in successful cases, though very slight tenderness of the lateral epicondyle may persist. The dose of hydrocortisone we have used for most patients is 25 mg. This may well be more than is necessary, as we have had successful results with half this amount in 10 cases.

I have given the results of treatment in 57 cases at periods varying from one to three weeks after the injection. To judge the value of hydrocortisone in this condition it is necessary to know more about the duration of benefit from the injection and about the number which relapse. The original series of 31 patients (Quin and Binks, 1954) have, therefore, been followed up. Of this 31, we have had no recent news of 4. Of the remaining 27, 8 have maintained the relief of symptoms following one injection, the period of observation being eight to ten months. 6 patients have relapsed once but have been relieved by a second injection. They have had relief for periods of seven to nine months, with two injections. 2 patients have relapsed twice but relief has been maintained by further injections for seven to nine months. Thus 16 out of 27 patients have had relief of symptoms with one or more injections for periods of between seven to ten months to date.

Of the remaining 15 in the group of 31 patients, 2 relapsed at four months and one at six months, but the symptoms were not so severe as they were originally. Incidentally, it is usually though not always the case that the symptoms on relapse are not so severe as the original symptoms. In 2 further patients there was a return of symptoms at six weeks and two months but they were so mild that a further injection was considered unnecessary. In 3 patients there was a full return of symptoms at ten days, two and a half months and three months, but the patients did not favour a second injection.

Of those for whom follow-up is incomplete, 1 is known to have had relief for six months, relapse then occurred but the duration of relief from a second injection is not known. The other 3 patients for whom follow-up is incomplete are known to have been relieved for three to four weeks, but we have not seen or heard from them since.

There were 3 absolute failures in this series of 31 cases.

To summarize the results in 31 cases. 17 are known to have relapsed. Relapses occurred at periods varying from ten days to six months, but most relapses occurred between two and four months. It has been possible to give relief, which is still maintained, to 16 out of 27 patients for periods varying from seven to ten months with one or more injections.

5 cases of medial epicondylalgia or golfer's elbow have been treated with hydrocortisone. 4 experienced complete relief and 1 partial relief following the injection. 3 of these patients relapsed.

Subacromial Bursitis and Supraspinatus Tendinitis

Hollander (1953b) stated that hydrocortisone injections were successful in relieving symptoms in 80% of cases of acute subacromial bursitis but that symptoms were relieved in only 49% of cases of chronic subacromial bursitis. Ramsey and Key (1953) state that of

12 patients with acute calcific bursitis, 10 were completely and 2 partially relieved with one or two hydrocortisone injections, and they considered the response better than to any other form of treatment. In 15 patients with chronic bursitis—the frozen shoulder group—only 2 were completely relieved, 6 partially relieved and 7 had no benefit. They suggest that the reason for failure in the chronic cases is that the bursa is partially obliterated.

We have treated 18 cases of painful shoulder due to subacromial bursitis or supraspinatus tendinitis. 4 of these were cases of acute bursitis. The acute cases had severe pain at rest, preventing sleep, and the pain was greatly increased by the slightest movement. 37.5 mg. hydrocortisone was injected into the bursa in these cases. In 3 cases the severe rest pain was relieved within forty-eight hours, but there was still pain on movement, though not of the former severity. In one patient marked relief occurred but there was still some pain at rest. Improvement then continued and there was full, painless movement in one patient at one month, in another at six weeks, but in a third full movement was not achieved for six months. The fourth patient is still improving one month after injection.

We have treated 14 cases of painful shoulder in which the symptoms were not acute. 9 patients had had symptoms for three to six months, 4 for two months or less and 1 for a year. Marked relief of symptoms occurred in 7 patients and no benefit in 7. 7 patients had marked restriction of movement and only 2 of these improved. 7 had full movement or limitation of rotation only and of these 5 improved and 2 had no benefit. Those who improved had had their symptoms for an average of three months, whereas those with no benefit had had them for an average of five months.

It seems that success is most likely to be achieved in acute cases and in those without severe limitation of movement. Ramsey and Key (1953) consider that the treatment of chronic cases with marked limitation of movement, that is frozen shoulder, is manipulation combined with a hydrocortisone injection, the latter making the post-operative course less painful and cure more prompt and certain.

We have also injected the subacromial bursa with hydrocortisone in 12 patients with rheumatoid arthritis in whom there was severe shoulder pain considered to be due to bursitis. Fluid was obtained from the bursa in 4 cases. Following the injection 8 patients experienced marked relief of pain, this being accompanied by some increase in shoulder movement in 7. In 1 patient there was only slight improvement and in 3 no benefit. One patient has not relapsed during one year of observation, but relapse has occurred in the other 7 after intervals varying from three to eight weeks. It can be concluded that injection of the bursa is a worthwhile procedure in subacromial bursitis due to rheumatoid arthritis and that it may help the patient over an acutely painful episode.

Other Bursæ

I have only treated one case of traumatic prepatellar bursitis. There was relief of pain and no recurrence of fluid when she was seen three weeks after the injection, but later follow-up reveals that the pain gradually returned a few weeks after she was last seen. Henderson and Henderson (1953) refer to 10 cases of prepatellar bursitis and 4 cases of olecranon bursitis of traumatic origin, which were successfully treated with hydrocortisone. Only one case relapsed in a period of four months' observation. Incidentally they considered that 12.5 mg. hydrocortisone was as effective as a larger dose in the treatment of these forms of bursitis.

I have only treated 2 cases of semimembranous bursitis complicating rheumatoid arthritis. In one the bursa disappeared after two injections and in the other there was no benefit.

Plantar Fasciitis

We have treated 4 cases. In 3 patients there has been almost complete relief of symptoms. 2 of these patients required a second injection to produce a beneficial result. There has been no recurrence during four months' observation in 2; 1 successful case was only done a month ago. The fourth patient had no benefit from two injections.

Pain near the Greater Trochanter

I would like to mention another small group of cases. 6 patients have complained of pain in the region of the greater trochanter. Examination revealed no clinical or radiological evidence of arthritis of the hip, but in each case there was an acutely tender area in the region of the greater trochanter. The symptoms had been present for periods of a few months to five years. In 1 patient the X-ray showed small opaque spots presumably due to calcification in the region of the greater trochanter. 5 of these patients had marked relief from a hydrocortisone injection into the tender area and in 2 it was complete. One had only moderate relief. In 2 patients relief had been maintained for over four months without relapse. One patient relapsed at four months but responded to a second injection. The other 2 have not been observed for long.

We have injected tender areas near the ankle-joint which were thought to be responsible for symptoms with success in 3 cases and failure in 4.

Tenosynovitis

We have injected very few cases of tenosynovitis. I can record success in 1 case of tenosynovitis associated with rheumatoid arthritis and 1 case of de Quervain's tenosynovitis. I have also had 1 failure in de Quervain's tenosynovitis.

Howard *et al.* (1953) record success from local injection of hydrocortisone in all of 8 cases of tenosynovitis, 6 cases of trigger finger and 2 cases of de Quervain's tenosynovitis. It is of interest that no improvement resulted from hydrocortisone injection in 5 cases of simple ganglion in their series.

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Reiter's Disease: A Review of the Present Position

By J. F. BUCHAN, M.A., M.D., M.R.C.P.

REITER'S disease has been the subject of considerable interest during recent years and many articles about it have appeared in the medical press. In spite of this, it remains a very ill-defined syndrome and some doubt that it exists at all. Others, though recognizing its existence, hold widely differing views as to its definition, ætiology and mode of transmission. The assumption that Reiter's is a venereal disease, for instance, would be disputed by most continental writers, who regard it as a complication of bacillary dysentery.

The disease has been given many names (Table I), none of which is entirely satisfactory,

TABLE I.—REITER'S DISEASE—SYNONYMS

- Rheumatismus intestinalis cum ulcere (Caelius Aurelianus).
- Arthritis dysenterica (Huette, 1869).
- Arthritis enterica (Schittenhelm and Schlecht, 1918).
- Ruhrreumatismus (Dorendorf, 1917).
- Ruhrreumatoid (Schemensky, 1918).
- Arthritis urethritica (Moltke, 1936).
- Syndrome conjunctivo-uretro-synovial (Fiessinger and Leroy, 1916).
- Reiter's disease (Musger, 1934).
- Spirochætosis arthritica (Reiter, 1916).
- Infectious uro-arthritis (Hollander, 1953).
- Venereal arthritis (Ford, 1953).
- Dysenteric arthritis (Harkness, 1949).
- Non-gonococcal arthritis (Harkness, 1949).

and in this article it will be referred to as Reiter's disease or syndrome as it is thus most widely known.

The syndrome may be defined as one of unknown ætiology, characterized by the presence of three essential symptoms, urethritis, conjunctivitis and arthritis.

The case described by Reiter (1916) showed the characteristic triad of symptoms and followed an attack of diarrhœa and abdominal pain. Similar cases complicating dysentery had, however, been reported before. Indeed, Manson-Bahr (1943) states that Caelius Aurelianus mentioned post-dysenteric arthritis in the fifth century; certainly Krauter