Current Practice

JOINTS AND THEIR DISEASES

Hand and Wrist

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The hand is the easiest part of the body to examine and one of the best mirrors of generalized disease. It is not the purpose of this paper to discuss its value in assessment of anaemia, the significance of the "succulent hand" of syringomyelia, or the neuromuscular changes to be seen in conditions such as motor neurone disease, but to discuss only those disorders generally considered to be "rheumatic," though a complete divorce from generalized disease is obviously impossible.

Joints Affected

Distal Interphalangeal Joints.—The d.i.p. joints are commonly involved in generalized osteoarthritis and psoriatic arthritis. They are only rarely affected by rheumatoid disease. In osteoarthritis Heberden's nodes occur as bony swellings over the dorso-lateral aspect of the base of the terminal phalanx, and the E.S.R. is normal. Recognition of osteoarthritis is important, since patients commonly consider they have rheumatoid arthritis, and reassurance that they do not have crippling arthritis is of incalculable value. The distal joint changes of psoriatic arthritis may be difficult to distinguish from Heberden's nodes, but are usually associated with nail changes, such as pitting, undermining, ridging, and hyperkeratosis, and there may be a topographical relation of affected nails and joints. Erosive changes may be seen on radiographs. Gouty tophi are sometimes found in this region also. Clubbing may be the presenting feature in cancer of the lung, and other evidence of hypertrophic osteoarthropathy may be found. As well as chronic chest infection, cyanotic heart disease, cirrhosis, ulcerative colitis, and paraplegia, clubbing also accompanies interstitial lung disease in rheumatoid arthritis. Changes of the terminal phalanx may be found in acromegaly with the spade-like hand and the tufted terminal phalanx. Similar radiographic changes may be found in hyperparathyroidism. Shortening of the phalanx may occur with systemic sclerosis and vascular changes may be apparent; resorption of the phalanx is seen radiographically. In the nail folds small infarcts are commonly seen with rheumatoid arthritis on close inspection, but these may also be a sign of other diffuse disorders of connective tissue such as polyarteritis nodosa and systemic lupus erythematosus.

Proximal Interphalangeal Joints.—These joints are commonly involved in rheumatoid arthritis in a symmetrical fashion. Soft-tissue swelling gives the finger a spindle shape. Secondary deformities may produce swan neck deformity, with hyperextension of the joint and secondary flexion deformity of the d.i.p. joint. Conversely a boutonnière deformity may occur, with flexion at the joint and secondary hyperextension at the d.i.p. joint. The range of movement of the joint should be

observed actively and passively. Bony swelling at these joints may occur and indicates osteoarthritis. It may sometimes be pronounced and produce a Bouchard's node, mimicking rheumatoid arthritis.

Metacarpo-phalangeal Joints.—Soft-tissue swelling of these joints is a feature of rheumatoid arthritis, particularly in the index and middle fingers. It is usually symmetrical, and may be associated with volar subluxation and limitation of movement. It is at these joints that ulnar deviation occurs. While the bony swelling of osteoarthritis may occur here, it is less common and less marked than in other finger joints (Fig. 1). Sometimes a destructive arthropathy produces

FIG. 1.—Distribution of joints affected by osteoarthritis (O.A.) and rheumatoid arthritis (R.A.). Those only occasionally affected are shown in lower case letters.

arthritis mutilans in rheumatoid arthritis and in psoriatic arthritis, so that the fingers can be pulled in and out like an opera glass. There is often surprisingly little pain with this severe type of arthritis, but careful examination should be made of the spine in these patients, for it is commonly associated with marked atlanto-axial subluxation and fused sacroiliac joints. An important differentiation in synovitis of the m.p. and p.i.p. joints is viral arthropathy, particularly following rubella. The signs may be exactly like rheumatoid disease, but the clinical history gives the clue and the prognosis is excellent. Rheumatoid factor is absent from the blood. Hypermobility of the joints may be found in hereditary disorders of connective tissue such

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as Ehlers-Danlos syndrome, but may occur as part of the hypermobility syndrome, and together with hypermobility of the wrist it is possible in these patients to hyperextend the thumb so that it is parallel with the dorsal aspect of the forearm. Women with this syndrome often develop premature osteoarthritis and may experience a good deal of aching.

Wrist.—The first carpo-metacarpal joint is classically affected in osteoarthritis, when there is pain, crepitus, and bony swelling. Rheumatoid arthritis involves the carpus, radio-carpal joints, and ulnar styloid process with swelling, tenderness, limitation of movement, warmth, and redness if the disease is particularly active. Juvenile rheumatoid arthritis (Still's disease) may affect the wrist with residual limitation of movement. Acute gout in the hand usually occurs as a hot, red, severely painful wrist, waking the patient and showing desquamation on resolution; the diagnosis is confirmed by finding a high serum uric acid. This joint is also involved in hypertrophic pulmonary osteoarthropathy, showing bony swelling with an aching particularly prominent when the limb is dependent. Tuberculosis still occasionally affects isolated joints such as the wrist in a diffuse inflammatory process. Other types of synovitis which may involve the wrist include colitic arthritis, Reiter's syndrome, and gonococcal arthritis (rarely seen in England). Pain localized to the wrist may be a result of an ununited fracture of the scaphoid (revealed by history and radiography) and Kienboch's disease, shown radiographically.

Tendons and Muscles

Rheumatoid disease commonly involves the tendons. Flexion deformity at the m.p. joints may be due to ruptured extensor tendons, and this will be demonstrated by the patient's ability to extend the finger passively but not actively. Tenosynovitis may result from unaccustomed use of the hands or wrists; it produces pain in the line of the affected tendon, sometimes accompanied by redness or crepitus, which is aggravated by use. Stenosing tenovaginitis of a flexor tendon may be manifest by trigger finger, in which the digit can be flexed but only extended with a sudden effort, so that it clicks into position. The thickening of the tendon or a tendon nodule may be felt at the m.p. joint on the volar aspect, proximal to the joint line. Involvement of flexor tendons in rheumatoid disease is shown by slowness in flexing the fingers. A particular form of stenosing tenovaginitis is de Quervain's disease. There is localized tenderness along the tendon line at the radial styloid process, and if the thumb is grasped and the wrist forcibly taken into a position of ulnar deviation there is marked pain in this region (Finkelstein's sign).

Diffuse muscle wasting may occur with generalized neurological disorders, but wasting of the thenar eminence is an important sign in median nerve compression. This is a common disease, often presenting at a rheumatic clinic with, classically, nocturnal paraesthesiae of the thumb, index, and middle fingers relieved by wringing the hands. Often, however, the classic picture is blurred; pain may radiate up the arm, with occasional stiffness, and all fingers of the hand may be affected. It is not always easy to differentiate this condition from cervical spondylosis, with which it may be associated, and nerve conduction studies may be required. Nevertheless, the history with wasting of the thenar eminence, weakness of the opponens pollicis muscle, and diminution of sensation to objective testing over the affected area may give the diagnosis. The syndrome is common in pregnancy and also occurs with diseases such as rheumatoid arthritis (indeed it may be its presenting feature) and less commonly with myxoedema, myelomatosis, and acromegaly.

Skin and Fascia

Rheumatic disorders of the hand may be accompanied by skin changes, such as gouty tophi and intracutaneous nodules in

rheumatoid arthritis. Severe rheumatoid arthritis is often accompanied by palmar erythema, and—interestingly enough—this is the commonest cause of "liver palms," though spider naevi are absent and there is no evidence of liver disease. Tethering of the skin over the fingers may be an early sign of systemic sclerosis, and an earlier sign still the presence of Raynaud's phenomenon, which always precedes the disease. Psoriasis does not usually affect the hand, but pustular lesions may be found on the palms and soles, and these are indistinguishable from keratoderma blenorrhagica associated with Reiter's syndrome. The lesions of discoid and systemic lupus erythematosus may also be found on the hand. Dimpling of the skin in the palm is the earliest sign of Dupuytren's contracture, due to thickening of the palmar fascia, which as it progresses will produce flexion of the little, ring, and index fingers in that order. This may also be a late stage of the shoulder-hand syndrome, which earlier manifests a diffuse swelling of the hand associated with limitation of movement of the shoulder. The swelling may resolve completely leaving no residual disability, but in a small proportion of cases the disease progresses to flexion deformity of the fingers. The syndrome should be borne in mind, particularly if the patient has had a coronary thrombosis.

Function

It is how the hand works that matters mainly, not how it looks. The range of movement at the wrist and the degree of pain must be assessed. It is important to note whether the patient is able to make a fist and what is the strength of grip. The ability to perform fine movements in relation to the patient's job is particularly important.

Treatment

Accurate diagnosis is essential, because on this basis a proper prognosis can be given, and many of the patient's fears can be alleviated.

Splintage is an important adjunct to treatment of the hands. Active synovitis should be treated with rest splints at night to minimize inflammation in the joint and to prevent deformity. Painful limitation of wrist movement necessitates a plastic splint, made so that the patient's job can be performed satisfactorily. Extensor tendons, ruptured by rheumatoid involvement, may well heal with a lively splint (Fig. 2), which may

FIG. 2.—Lively splint for treatment of ruptured extensor tendons of the fingers. Elastic is used as the tension member.

have to be worn for three months. Flexion deformity of the fingers may be overcome with the newly produced plastic, Prenyl, which is malleable at hot water temperature. The splint may therefore be modified frequently to open the fingers (Fig. 3). Splints may also help to restore function: correction of subluxation at the first m.p. joint will enable the thumb to perform fine movements adequately.

Occupational Therapy.—Assessment of the patient is required, if the hand is markedly affected, to investigate the activities of daily living. Many small modifications to implements, such as wide handles for cutlery and combs, can be made with benefit to the patient. Mobilization of the upper limb, especially after surgery or injuries, is best undertaken in this department also. It should be remembered that weakness of the hand may prevent patients maintaining their feet, and chiropody may be required.

FIG. 3.—Prenyl splint for treatment of flexion deformities of the hand.

TODAY'S DRUGS

With the help of expert contributors we print in this section notes on drugs in common use.

Diuretics. I—Benzothiadiazines and Related Drugs

A variety of different diuretics are available, but the main ones used for the mobilization of oedema fluid and the prevention of its reaccumulation in heart failure, renal failure, and cirrhosis of the liver are chemically related to chlorothiazide. Some of the newer substances which either have a greater potency or cause conservation of potassium will be the subject of a later article.

For a drug to be useful in the treatment of oedema it must increase the renal output of sodium chloride as well as water. The diuresis caused by water itself or by ethyl alcohol, which inhibits the release of antidiuretic hormone, has no therapeutic value. Solutes such as mannitol, which are filtered at the glomerulus and not absorbed by the renal tubule, are occasionally used in therapy as osmotic diuretics. The depletion of salt and water that occurs in diabetics with heavy glycosuria is a well-known example of osmotic diuresis.

However, the great majority of diuretics act directly on the renal tubule by depressing the active reabsorption of sodium or chloride ions. The increase in water excretion is a secondary result of decreased reabsorption of electrolytes.

The mercurial diuretics were one of the first potent therapeutic agents to be introduced in medicine and are still among the most potent of diuretic drugs. They are now less often used because the benzothiadiazines are as effective for most purposes, can be given orally, and are less toxic.

Carbonic anhydrase inhibitors, such as acetazolamide, had a period of fairly extensive use before the introduction of the benzothiadiazines. They cause a metabolic acidosis and their effect is not well maintained in long-term treatment. They have been largely replaced by the benzothiadiazines, but it is interesting to note that the original synthesis of chlorothiazide was a result of research into a series of compounds with carbonic-anhydrase-inhibiting properties.

Since the introduction of chlorothiazide a large number of chemically related substances have been discovered. Individual

Physiotherapy with wax or oil baths may prove palliative in rheumatoid arthritis and systemic sclerosis, and hand exercises help to restore function. Patients with osteoarthritis often benefit from faradic hand baths. In the shoulder-hand syndrome active exercises are indicated and during the care of coronary thrombosis it may be prevented by mobilization of the shoulder.

Surgery.—Rest usually causes resolution of tenosynovitis, but local injection of hydrocortisone acetate will give dramatic relief. If this is not successful, especially in trigger finger, division of the thickened sheath is indicated. Injection of the carpal tunnel will also produce relief of median nerve compression temporarily, but this is usually best treated by decompression, which can be undertaken as a day case. During pregnancy, however, splintage of the wrist is sufficient.

If rupture of an extensor tendon occurs in rheumatoid arthritis from wear at the wrist, then arthrodesis of the wrist is indicated, with excision of the lower end of the ulna. Synovectomy of the fingers still awaits evaluation. Rheumatoid involvement of isolated joints often responds for long periods to local injection of hydrocortisone. Excision arthroplasty at the moment seems the treatment of choice for severely damaged m.p. joints, though prosthetic replacement is being investigated.

members of a group differ greatly in their potency per unit weight and their duration of action, but, with the exception of frusemide, their potency at maximal dose is similar.

Clinical Pharmacology

Benzothiadiazines are relatively well-absorbed when given by mouth. The main action of the thiazides is to increase renal excretion of sodium chloride. Stop-flow studies suggest that the thiazides inhibit the proximal reabsorption of sodium chloride, but they may also have some effect on the distal tubule. Though many members of the thiazide series have some carbonic-anhydrase-inhibiting action this is unimportant for their diuretic action. The thiazides are actively transported into the tubular fluid in the proximal tubule. This transport mechanism may be important in causing an increased amount of the drug to be present in the tubule, but it is not the main explanation of the drug's diuretic activity.

Thiazides have no direct action on glomerular filtration rate, but if they are used in large doses the resulting depletion of plasma and extracellular fluid volume will cause a reduction of renal blood flow and so a fall in G.F.R.

All thiazides increase the excretion of potassium when used in therapeutic doses. Inhibition of sodium reabsorption in the proximal tubule means that a higher concentration will be presented to the distal tubule, and this favours exchange of sodium in the tubular lumen with potassium in the tubular cells. In some oedematous states, particularly cirrhosis of the liver with ascites, the aldosterone secretion rate is increased and this increases potassium loss.

The thiazides decrease uric acid clearance and lead to an elevation of serum urate in most patients. This effect can be overcome by administration of probenecid.

Thiazides also decrease the free water clearance ($C_{H_2O-C_{Osm}}$) and they have been used in the treatment of diabetes insipidus. It has been suggested that this action depends on the increase in plasma renin caused by the salt depletion induced by thiazide treatment.¹

Thiazides are widely used alone or in combination as hypotensive agents. This aspect of their use has been covered in an earlier article.²