

Recovery of FIGLU from the column was measured by applying 3 μ moles and 5 μ moles respectively to the column. In each case the recovery was 85%.

Repeat chromatograms of a urine sample containing 1 mg. FIGLU per ml. gave consistent values within $\pm 5\%$. Quantities of fluid containing from 50 μ g. to 2 mg. of FIGLU may be applied to the column.

Comments

Ion-exchange chromatography provides a quick and reliable method for determination of FIGLU. A complete analysis takes about six hours.

The method was applied successfully to the estimation of urinary FIGLU in kwashiorkor patients after they have been fed with histidine 0.5 g. per kg. body-weight. The results will be presented in full elsewhere.

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ASSOCIATION OF SUDECK'S ATROPHY WITH DUPUYTREN'S CONTRACTURE

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THE association of thickening of the palmar fascia resembling that in Dupuytren's contracture with the post-traumatic hyperæmic disorder of Sudeck was described by Plewes (1956). This paper reports 31 patients in whom this association was found between 1959 and 1963 in an accident service treating about 3100 new patients annually.

Patients

There were 24 women patients and 7 males. Their ages ranged from 39 to 81 years; in 26 the ages ranged between 42 and 68 years. All except 2 were personal patients.

Findings

The diagnosis was made clinically. The post-traumatic hyperæmic state is unmistakable. The hand is red, swollen, sweating, stiff, painful, and warmer than its fellow, with dilated dorsal veins. Radiographs may or may not show decreased bone density, and mottling of the phalanges varies in frequency, degree, and distribution. Radiological changes develop late.

The palmar fascia is thickened, often diffusely, but sometimes with the formation of nodules. Knuckle pads were absent in these patients, and only once had the condition progressed to the extent seen in established Dupuytren's contracture.

Of the 31 cases, hyperæmia was present in 13. In 2 of these (1 with severe hyperæmia) the fascia was unchanged; in 2 the fascia was thickened; and in 9 there were fascial nodules. Of the remaining 18 cases 7 had thickened fascia only, 4 nodules only, and 7 the shoulder-hand syndrome.

1 patient had rheumatoid arthritis at the time of injury.

2 had early Dupuytren changes in the opposite hand to a lesser degree. There were no epileptics.

The precipitating injuries were as follows:

<i>Wrist injuries</i>					
Colles fracture	..	..	..	..	22
Fractured radial styloid process	..	..	..	..	1
Sprain of arthritic joint	..	..	..	..	1
<i>Hand injuries</i>					
Crushed thumb	..	..	..	..	1
Fractured 4th metacarpal	..	..	..	..	1
<i>Elbow injuries</i>					
Dislocation	..	..	..	..	1
Fractured radial head	..	..	..	..	1
Cut	..	..	..	..	1
<i>Shoulder injuries</i>					
Fractured humeral neck	..	..	..	..	1
Contusion	..	..	..	..	1

The combination of Dupuytren's contracture and Sudeck's atrophy is not seen in the absence of trauma to the arm, though only 2 of the patients had hand injuries. The actual injury may be some distance from the hand and need not be severe. In some of the patients, in fact, the injury was trivial.

The distribution of changes in the palmar fascia is shown in the accompanying figure. The part of the fascia most often affected lay over the third and fourth metacarpals.

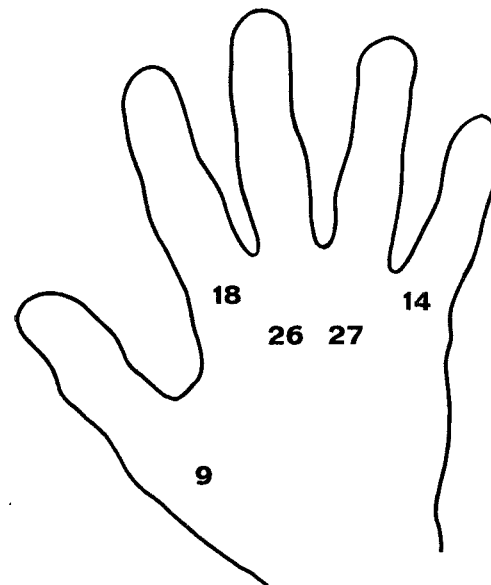
The patients often came from outlying areas, and about half were seen the day after injury when swelling was already present. The fractures and dislocations were reduced under general anaesthesia, and a dorsal plaster slab was applied over light padding, moulded over the lower ends of the radius and ulna and over the first metacarpal, and secured by a cotton bandage. This type of splinting was often maintained throughout treatment. Closed plaster splints were applied only after one or two weeks had elapsed.

Exaggerated positions such as the Cotton-Loder were avoided. In Colles fractures the wrist was usually kept in a neutral position or in 20° of flexion, and in other injuries in the position of function. Splinting was usually maintained for six weeks in such cases, and finger exercises were enjoined from the beginning.

Thickening of the palmar fascia was occasionally detected while the wrist was still in plaster, but most often it came on eight to ten weeks after the injury when the plaster had been off for from two to four weeks.

Treatment

Prevention is better than cure. This entails early and accurate reduction of fractures, splinting without constriction, and active rehabilitation from the beginning. The fact that the association of Sudeck's atrophy and Dupuytren's contracture is seen at least once every two months in a busy provincial centre suggests that it is commoner than is generally thought.



Distribution of diffuse thickening or nodule formation in palmar fascia.

For the established case, personal exhortation, vehement and repeated, seems the most effective treatment. Exercises with the arm raised, wax baths, and hot soaks at home were used in all cases. Drugs such as phenylbutazone were prescribed with caution, and usually without effect. Steroids were prescribed only once—in a patient with a troublesome shoulder-hand syndrome—and were not helpful. 2 patients benefited from repeated gentle manipulation of the interphalangeal joints under general anaesthesia.

2 patients underwent operations. In the 1st the operation was palmar fasciectomy for rapidly developing contracture following on the shoulder-hand syndrome. The progress of the condition appeared to be halted and the hand improved. In the 2nd a tender nodule was excised: it had prevented the patient from using the hand and was beginning to produce a fascial band. Improvement was rapid and striking, and full function was recovered.

Microscopy of the excised tissue in both cases showed a diffuse non-specific fibrosis, comparable with that in Dupuytren's contracture.

One hesitates to recommend operation when the injury has already resulted in disability, but these two results suggest that there may be a place for a restricted procedure in a small number of carefully selected patients.

The association of these two disabling conditions came on relatively late after injury, predominantly to the wrist, in middle-aged women. It is difficult to avoid the conclusion that it is almost confined to patients who from the outset are pessimistic, dependent, and neurotic.

Summary

Sudeck's atrophy was associated with Dupuytren's contracture in 31 patients, usually after wrist injuries in middle-aged women. The central portion of the palm was most often affected. The patients were treated conservatively, though there may be a place for surgery in selected patients.

I am grateful to my colleagues, Mr. T. Denness and Mr. L. H. Pimm, for allowing me to refer to patients under their care.

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EFFECT OF GLYCEROL BY MOUTH ON RAISED INTRACRANIAL PRESSURE IN MAN

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At the Second European Congress of Neurological Surgery in Rome in 1963, Cantore et al. described the successful use of glycerol for the relief of cerebral oedema in laboratory animals and in man. Because of the real need for another orally active osmotherapeutic substance to supplement urea, we decided to follow their lead and explore the application of glycerol.

Plasma Osmolality after Oral Administration of Urea or Glycerol in a Normal Subject

The first requirement was to see whether we could obtain a rise of plasma osmolality quickly enough to produce an effective osmotic gradient between brain-water and plasma.

This was first measured in the laboratory in a normal subject whose plasma osmolality changes following urea had already been charted, so as to get a comparison between the two substances.

75 ml. of glycerol was chosen as the dose to compare with 50 g. of urea. Actual measurement on a sample from the same batch of glycerol gave 996 milliosmols (mOs) for the 75 ml. dose. 50 g. of urea contains 833 mOs. The glycerol, mixed with an equal volume of iced lemon juice, was sipped slowly over 20 minutes. This mixture proved to be more palatable than urea, though it too produced a slight feeling of nausea immediately after the dose was finished. Headache, which developed from about 30 minutes onwards, was severe at about 2 hours, when it was relieved by lying down. After 75 ml. of glycerol, the plasma osmolality rose at about the same rate as after urea (fig. 1), but the rise continued for longer so that the maximum increase recorded (25 mOs per litre) was 25% greater than that produced by 50 g. of urea, and it remained above the urea maximum for 2 hours.

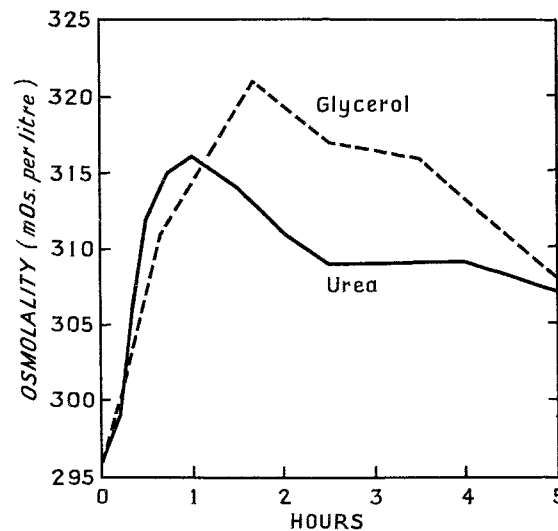


Fig. 1—Plasma osmolality after oral administration of glycerol (75 ml.) or urea (50 g.) in the same normal subject (weight 58.6 kg.).

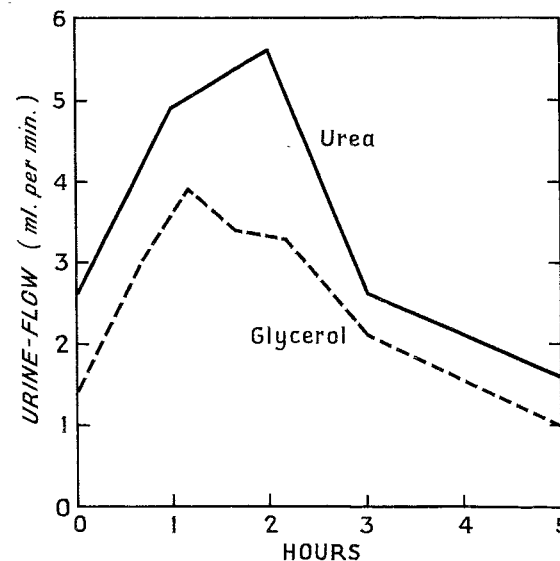


Fig. 2—Diuresis after oral administration of glycerol (75 ml.) or urea (50 g.).

After 75 ml. of glycerol, the plasma osmolality rose at about the same rate as after urea (fig. 1), but the rise continued for longer so that the maximum increase recorded (25 mOs per litre) was 25% greater than that produced by 50 g. of urea, and it remained above the urea maximum for 2 hours.

Diuretic Effect

The diuresis following 75 ml. of glycerol was less than that after 50 g. of urea (fig. 2) although the osmotic dose given was greater; 1018 ml. of urine was passed in the first 5 hours after urea, and 725 ml. after glycerol, when the state of hydration of the subject was comparable on the two occasions. This was to be

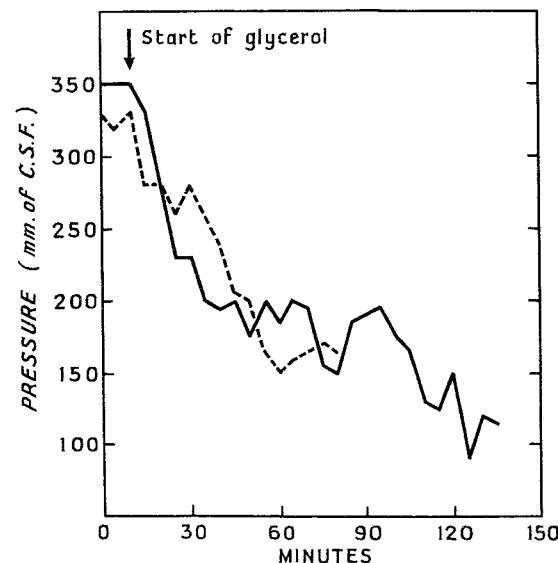


Fig. 3—Lumbar C.S.F. pressure after ingestion of 2½ oz. of glycerol in two patients with benign intracranial hypertension.