

discharging the larvae by a mature worm. Guinea-worms are known to discharge larvae in abnormal sites such as the extradural space (Reddy and Valli, 1967). The arthritis is not due to secondary infection, as in all the cases the culture was sterile. It is due to the products of parturition of the worm discharged into the joint. It is not due to the breaking up and crushing of the worm between the opposing bones during walking, for in every case the worm was entire without any break. In the last case operation was carried out on the third day after the onset of pain and swelling, and the worm was alive and moving. This again shows that it is the discharge of the larvae in an abnormal site which is responsible for the synovitis.

Gandhi (1962) treated his case by rest and antibiotics only after the chance removal of the worm (which got caught in the aspirating needle) and aspiration of the fluid. No mention of seeing the larvae was made in the report nor was a follow-up noted.

As a rule surgical procedures are carried out after the active stage of synovitis has been arrested, and conservative treatment should be given an adequate trial before surgery is undertaken. Conservative treatment in several cases of acute synovitis of the knee with a history of guinea-worm infection during the past few years was not successful. Entry of the worm into the joint cavity and liberation of its products of conception, giving rise to acute synovitis, was not thought of. So repeated aspirations with instillation of penicillin were given. Culture examination was always sterile and no definite diagnosis was made. Simple microscopical examination of the fluid was not made, as the finding of larvae in the fluid was not expected. Many cases ended up with chronic synovitis and involvement of cartilaginous and osseous portions of the joint, and were mistaken for gonococcal or tuberculous arthritis. Fluid in the joint with chronic proliferation of the synovial membrane persisted for months. Surgery was undertaken late in these cases in the form of synovectomy or arthrodesis, with consequent partial or complete stiffness of the knee after months of suffering.

Routine microscopy of the joint fluid in cases of acute synovitis disclosed larvae, and since larvae could not be seen with-

out the presence of the adult worm immediate removal of the worm and its extruded products from the joint was thought to be imperative. So arthrotomy in the acute stages was felt to be necessary for the removal of the offending worm and products, with irrigation of the joint cavity.

In our limited experience of this not so unusual but definitely unsuspected lesion we found that if the patient reported early, when the larvae could be seen in the fluid, the diagnosis was easy. In such cases arthrotomy for removal of the worm should be done. Removal of the worm and cleaning of the joint cavity was sufficient to restore a joint to normal use.

### Summary

The pathogenesis of arthritis of the knee joint in dracontiasis is not established. In four cases of acute arthritis of the knee joint guinea-worm larvae were found in the aspirated fluid and at arthrotomy the adult worm was seen in the joint. In all cases the worm was entire and in one case it was alive. The aspirated fluid was sterile on culture. This shows that the arthritis was due to the discharge of larvae by the worm in an ectopic site. Removal of the worm and cleaning of the joint cavity restored the joint to normal. If this is not done chronic synovitis and possible fibrous ankylosis will ensue.

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## Renal Papillary Necrosis with a Normal Pyelogram

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The concept that the primary lesion in analgesic nephropathy is in the medulla and that the cortical changes of so-called "chronic interstitial nephritis" are secondary (Kincaid-Smith, 1967) has been opposed on the ground that small kidneys may show an apparently normal caliceal system (Krikler, 1967).

We have encountered many patients in whom calices were well cupped and careful scrutiny of whom failed to reveal diagnostic radiological evidence of papillary necrosis in spite of unequivocal pathological evidence of papillary necrosis in biopsy, necropsy, or voided material. Thus we concluded that the renal papillary necrosis cannot be excluded on radiological grounds (Dawborn *et al.*, 1966).

To re-emphasize this point we illustrate it with the following case.

### Case Report

A 41-year-old woman was admitted to the hospital complaining of breathlessness. She had taken 6-10 analgesic tablets containing aspirin, phenacetin, and caffeine daily for 20 years. She was in

congestive heart failure, and had a blood pressure of 180/140, a blood urea of 124 mg./100 ml., and a haemoglobin of 50%.

An infusion intravenous pyelogram showed very little excretion of contrast medium and a retrograde pyelogram showed a normal caliceal system with no evidence of papillary necrosis (Fig. 1), but the kidneys were small (10 cm. in length). A renal biopsy revealed

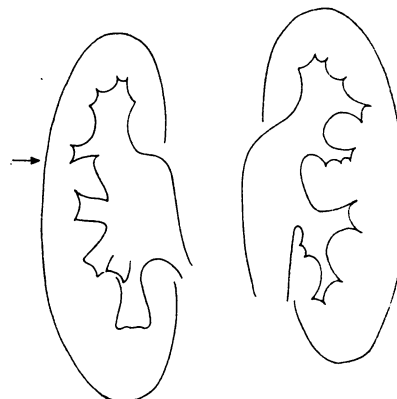


FIG. 1.—Tracing of the retrograde pyelogram. The arrow indicates the calix shown in Fig. 2.

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cortical changes of the type seen in analgesic nephropathy (Kincaid-Smith, 1967), and there was frank necrosis in the medulla.

The patient's condition deteriorated, and she died of Gram-negative septicaemia 10 days later. At necropsy both kidneys showed extensive papillary necrosis involving every papilla. The necrotic papillae were normal in shape, and, though they were smaller than normal, the calices were well cupped (Fig. 2).

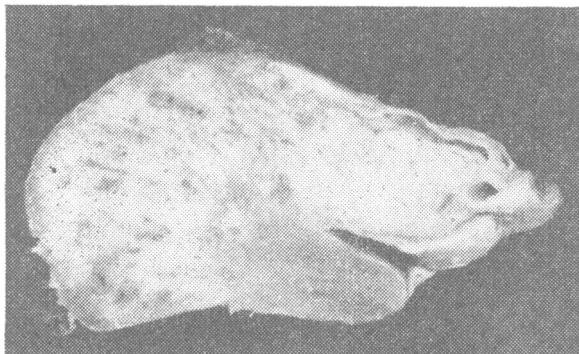


FIG. 2.—Transverse section through one of the papillae. The whole of the dark area shows necrosis histologically, but the papilla remains firmly attached and the calix shows sharply defined "cupping." All the papillae had similar appearances, which demonstrates why radiological evidence of papillary necrosis may be lacking.

### Discussion

The diagnostic radiological features of renal papillary necrosis depend on separation of papillae. When the necrotic

papillae do not separate the only change which may be apparent is a reduction in size of both the kidney and the papillae. Because the papillae often remain attached to the overlying viable medulla in analgesic nephropathy (Kincaid-Smith, 1967) the diagnosis of papillary necrosis cannot be excluded on radiological grounds.

We could cite many similar cases, the most striking being that of a patient who first developed papillary necrosis 10 years ago and in whom we have histological identification of numerous papillae, which she passed in the urine. Her intravenous pyelogram (Fig. 8 in Dawborn *et al.*, 1966) still shows no diagnostic features of papillary necrosis. It is cases of this type which are apt to be incorrectly labelled "chronic interstitial nephritis" (Kincaid-Smith, 1967) if the significance of the renal colic is overlooked and the lack of correlation between pathological and radiological features of papillary necrosis is not recognized.

### Summary

In renal papillary necrosis associated with abuse of analgesics the papillae may remain attached to the medulla after they become necrotic. As the radiological features of papillary necrosis depend upon separation of papillae they are not seen in such cases.

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## Medical Memoranda

### Necrosis of Oral Mucosa after Local Application of Crystal Violet

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Crystal violet applied topically has been used for the treatment of oral candidiasis for many years (Faber and Dickey, 1925), and is generally thought to be free from toxic effects. This paper reports the cases of two infants who had a severe mucosal reaction to local crystal violet.

#### CASE 1

A 1-month-old female infant was admitted to hospital in July 1959 because of difficulty with feeding. Crystal violet paint (in aqueous solution) had been applied to her mouth during the preceding two weeks for the treatment of thrush and she had received no antibiotic therapy. On admission she had a severe gingivoglossostomatitis; the oral mucosa was ulcerated, with a grey slough present, and she was in considerable pain and distress. There was no evidence of candidiasis at other sites, and a mouth swab was reported as "normal flora with no candida." Crystal violet applications were stopped and she was treated with dequalinium chloride paint locally and aspirin. The mouth healed almost completely in one week, associated with a return to normal feeding.

#### CASE 2

A 2-week-old male infant was admitted to hospital in July 1967 because of a febrile illness with cough and nasal discharge. During

the week before admission he had been treated with crystal violet 0.5% (*B.P.C.*) as a local application for oral thrush. The frequency of application had been increased to five times a day for the last three days. On admission he was dyspnoeic, the oral mucosa was heavily stained with crystal violet, and he was salivating excessively. The following day he developed partial upper airway obstruction, and on examination of his mouth and larynx a thick white membrane was seen on all mucosal surfaces that stripped off, leaving a bleeding surface. Microscopical examination of the membrane showed no evidence of candida or corynebacteria. He was treated with parenteral penicillin, corticosteroids, and gentle pharyngeal suction, and for the next 48 hours the partial respiratory obstruction gave cause for anxiety. However, tracheostomy or intubation was not required and he made a gradual recovery, though swallowing did not return to normal for one week. The sloughs separated and the oral and pharyngeal mucosae were normal on discharge home. All oral swabs were negative for candida.

### DISCUSSION

Crystal violet (methylosaniline chloride; gentian violet) is a member of the triphenylmethane group of dyes. The *B.P.C.* (1963) preparation consists of hexamethylpararosaniline hydrochloride, and the paint of crystal violet is a 0.5% solution (*B.P.C.* Addendum 1966). It is stated to be "a powerful, non-irritant antiseptic which has a selective action on Gram-positive organisms" (*B.P.C.*, 1963). The *U.S.P.* preparation is hexamethylpararosaniline hydrochloride, usually admixed with penta- and tetra-methylpararosaniline hydrochloride.

Crystal violet was regarded as the treatment of choice for oral candidiasis by Faber and Clark (1927), who used an aqueous 1% solution twice a day for three days, and then on alternate