

EARLY LOCAL EXPERIENCE OF ANKLE ARTHROGRAPHY AND ITS INFLUENCE ON MANAGEMENT OF PATIENTS WITH ANKLE INJURY

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ABSTRACT

Ankle arthrography was performed on 64 patients with a history of ankle injury from 21 January 1986 to 11 October 1988. There was a male predominance in the ratio of 15 to 1 and the mean age of our patients was 22 years. A total of 65 arthrograms were obtained as one patient had bilateral ankle arthrograms. Of these, 29 arthrograms were normal. A year after completing this study, we attempted to retrieve our patients' case-notes and reviewed their subsequent management. Our results showed that multiple factors influenced the further management of our patients and arthrogram did play a role in this respect.

Keywords : ankle arthrography

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INTRODUCTION

In our clinical practice, we commonly meet with ankle injuries. In an attempt to rationalise the investigation of these cases, we decided to conduct a study on ankle arthrograms and determine the influence it had on subsequent management of these patients. Despite Computed Tomography and Magnetic Resonance Imaging gaining popularity in the investigation of the ankle, the cost of these have hampered their routine use. Arthrography therefore is still able to provide important information in the investigation of ankle injuries⁽¹⁾.

Ankle arthrography is a relatively simple procedure requiring a moderate amount of skill. Conventional fluoroscopic equipment only is required and routine AP, lateral and oblique views of the ankle suffice.

The procedure can assess the integrity of ligamentous structures of the acutely injured ankle, evaluate articular cartilages, and detect and localise loose bodies. As far as is known to the authors, this is the first local attempt at studying ankle arthrography in such numbers.

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PATIENTS AND METHODS

Sixty-four patients seen at the Orthopaedic Departments of Tan Tock Seng Hospital and Toa Payoh Hospital for ankle injury were referred to their respective Radiology Departments for ankle arthrography. These were all performed by two radiologists (CSG and KTK).

Ankle arthrography is performed with the patient supine and the course of the dorsalis pedis artery marked out in order to avoid its puncture. The selected needle entry point is then indicated with indelible ink. A 21-gauge 1-1/2 inch needle is used.

After cleaning with cetrimide and spirit, followed by administration of local anaesthetic agent (1% Xylocaine), the joint is entered under intermittent fluoroscopy. The tip of the needle should lie between the anterior margin of the tibia and dome of the talus. Six to eight cc of Conray 280, Omnipaque 240 or Iopamiro 200 is then introduced. After injection, the needle is removed and the ankle manipulated briefly.

Standard overcouch views are then taken in the anteroposterior, lateral and both oblique projections.

We studied our patients from 21 January 1986 to 11 October 1988. In November 1989, a year after completing this study, we attempted to retrieve all these patients' case-notes. We were successful in tracing fifty-three patients' case-notes.

RESULTS

A total of 64 patients were examined, with 65 ankle arthrograms performed. One patient had bilateral ankle arthrograms.

There were 60 males and 4 females, making a male to female ratio of 15 : 1.

The age of our patients ranged from 17 years to 52 years with a mean of 22 years. The racial distribution as is seen in Table I shows the Chinese and Indians to be the major groups to be examined.

Table I
Racial Distribution of Patients

RACE	NO. OF PATIENTS
Chinese	48
Indian	10
Malay	4
Others	2
Total	64

Arthrography revealed 18 abnormal right and 18 abnormal left ankles. There were 29 normal arthrograms. Table II shows the distribution of these 29 normal arthrograms.

Table II
Distribution of Arthrograms

RIGHT ANKLE		LEFT ANKLE	
16	Normal	13	Normal
18	Abnormal	18	Abnormal

Four of these patients with normal arthrograms were arthroscopied and one patient had a CT scan and bone scan. The CT scan was normal and the bone scan showed a "hot spot" at the lower tibia. This patient absconded follow-up six months later. The arthroscopic findings of the four patients with normal arthrograms are shown in Table III.

Table III
Arthroscopic Findings of 4 Patients
with Normal Arthrograms

PATIENT	ARTHROSCOPIC FINDINGS
1	Anterior/lateral/posterior articular surface of tibia showed synovial overgrowth.
2	Torn anterior talofibular ligament with osteochondral fragment of dome of talus.
3	Anterior talofibular ligament tear with avascular necrosis of the neck and body of talus.
4	Old calcaneofibular ligament tear with chondromalacic changes over tibial articular surface.

Patient 1 was medically downgraded permanently for national service duties. Patient 2 was awarded 2% workman's compensation. Patient 3 refused surgery and was downgraded for national service duties. Patient 4 also refused surgery and was discharged from further follow-up.

Of the remaining 25 patients with normal arthrographic findings, only 22 case-notes could be retrieved, making a total of 26 patients' notes. The case-notes show that 12 were discharged, 6 were medically downgraded for national service and 8 absconded follow-up.

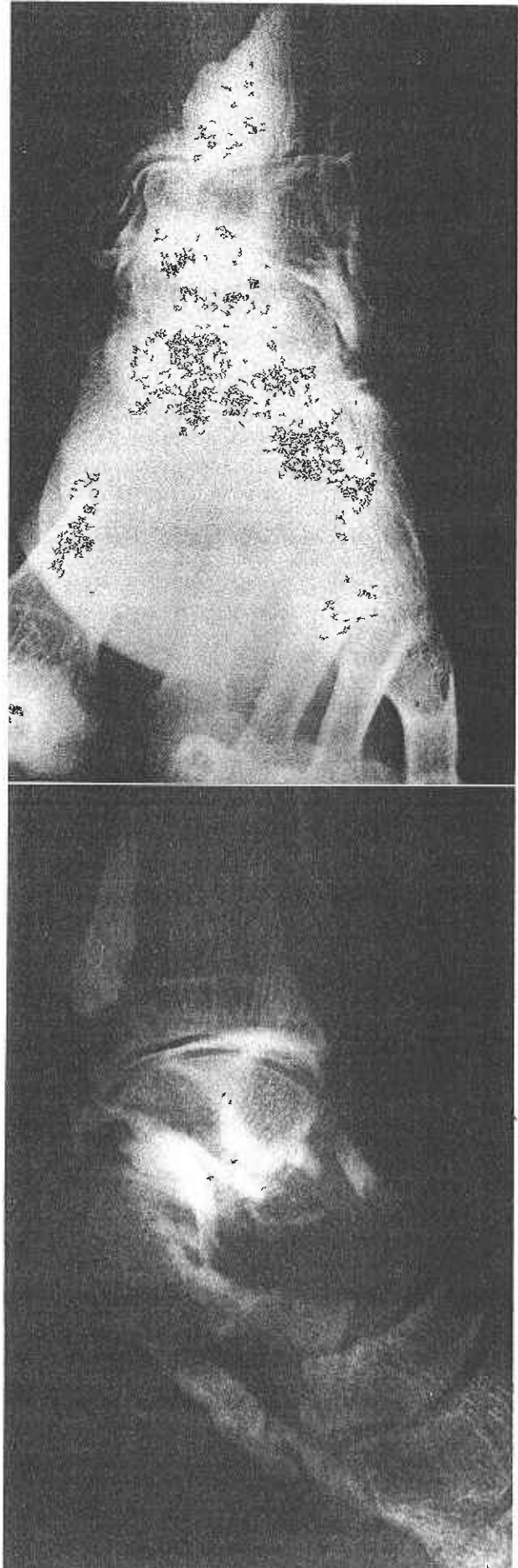
There were 36 patients with abnormal arthrograms. We were able to trace 27 case-notes. Of these, 14 patients were arthroscopied or operated on. Twelve of these patients' arthrographic findings concurred with arthroscopic or operative results.

Of the remaining 2 patients, one showed tears of the calcaneofibular, anterior talofibular and distal anterior tibiofibular ligaments on arthrography (Figs 1a & b). The arthroscopy was normal.

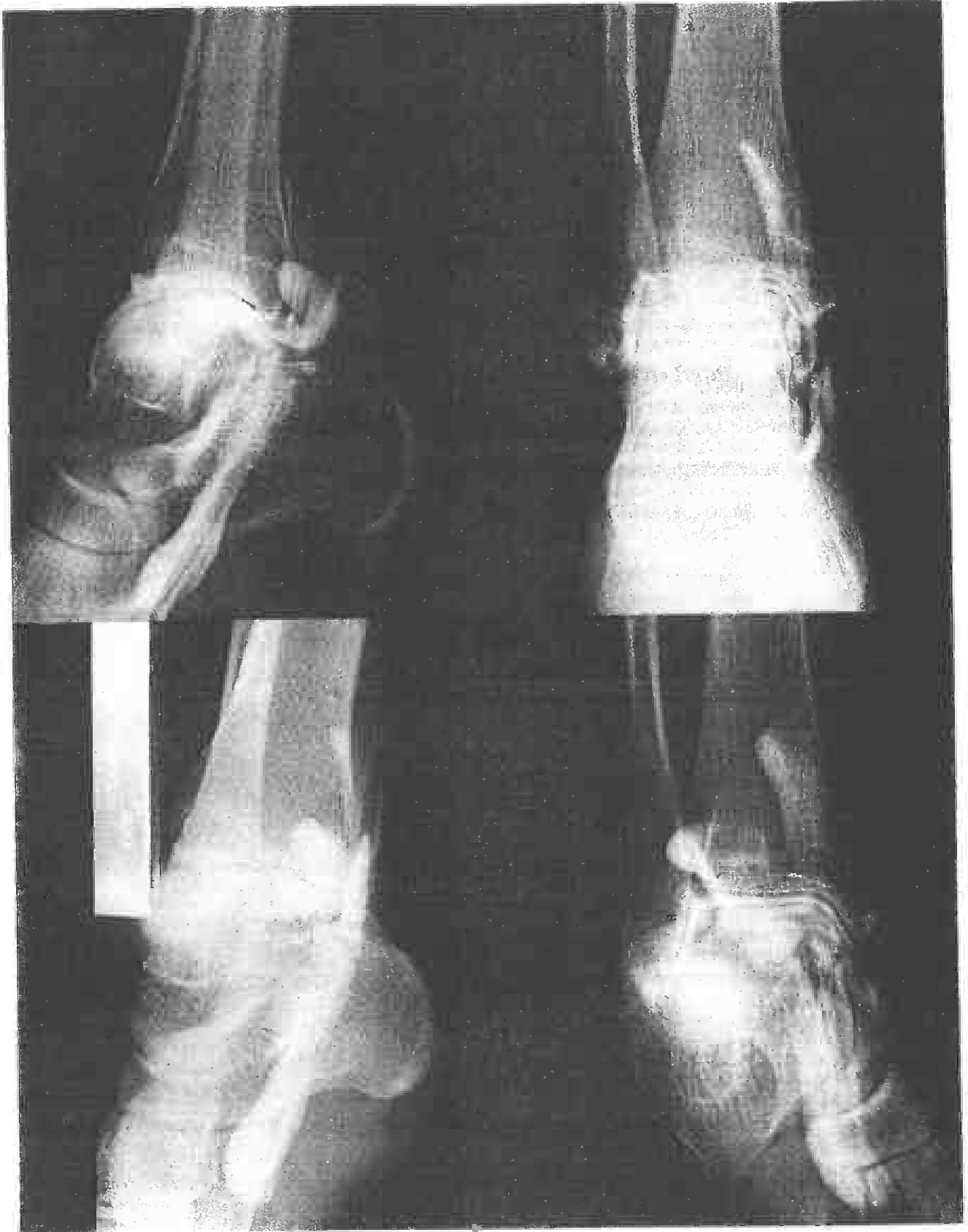
The other patient was thought to have a tear of the deltoid ligament (Figs 2a & b). The arthroscopy instead showed torn anterior talofibular ligament and fibrin flakes over the articular surface of the talus and tibia. The first patient was discharged and the second medically downgraded permanently for national service.

The outcome of the patients with abnormal arthrograms whose case-notes could be traced are shown in Table IV.

Figs 1a & b. Tears in calcaneofibular, anterior talofibular and distal anterior tibiofibular ligaments



Figs 2a & b. Tear in deltoid ligament



DISCUSSION

The ankle is a compound joint formed by the tibia, fibula and talus. It is a joint that is commonly injured especially in the athletic and young. Untreated or inadequately treated trauma to the ankle may have serious consequences such as persistent

pain, swelling, unsteady gait on uneven ground and chronic instability^(2,4).

In 1944, Berridge and Bonnin⁽⁵⁾ described ankle arthrography and discussed its value in the diagnosis of rupture of the tibiofibular syndesmosis. Since then, this examination

has established itself as a valuable and accurate investigative tool.

The authors' aim was to determine the influence, if any, of ankle arthrography on the subsequent management of patients with ankle injury.

Patients with recent fractures were excluded from our study.

All patients who came for ankle arthrograms had preliminary anterior-posterior and lateral radiographs taken first. These were reviewed before the arthrograms were done.

In the group of normal arthrograms all patients' preliminary radiographs were normal except for 3 which showed small osteophytes.

In the second group with abnormal arthrograms, all similarly had normal plain radiographs except for 4 patients with minimal degenerative changes, 2 with old fractures and one with a cystic lesion of the talus which proved to be Grade II Giant Cell tumour.

Our patients tolerated the arthrographic procedure extremely well. We did not meet with any complications except in a young lady who developed chemical synovitis after the arthrogram. Incidentally, this patient had a peroneal tenogram as well and the authors feel that the synovitis was most likely from this tenogram. She had to be admitted for 6 days and was fully recovered on discharge.

One limitation of ankle arthrography is that it should ideally be carried out as soon as possible after an injury. Delays of a week or more can result in false negatives as the tears in the capsule or ligament seal by organising clot and adhesions⁽⁶⁾.

Some of the false negatives in our series may be partly explained by these factors. However, our sensitivity in detecting abnormality appears to be acceptable, as seen in those patients with subsequent arthroscopy or operation.

In the group with normal arthrograms, the majority who kept their follow-up appointments were discharged. Those who were arthroscoped were medically downgraded for national service.

A total of 12 patients were discharged. Only three patients were medically downgraded solely on clinical grounds.

Interestingly, note that 4 patients who were symptomatic at their last follow-up were also discharged.

In looking at the group with abnormal arthrograms, of the 23 patients who kept their follow-up appointments, 16 of them were either medically downgraded or accepted surgery. Only 7 were discharged with 2 of them refusing surgery.

Table IV
Outcome of Patients with Abnormal Arthrograms

OUTCOME AFTER 1 YEAR	NO.
Discharged	7
Medically Downgraded	11
Operated On	5
Absconded	4
Total	27

Again, five of these seven patients, who were discharged remained symptomatic at their last follow-up. Only one patient operated on for anterior talofibular ligament tear was asymptomatic. In this study, we discovered that none of our patients was offered surgery on abnormal arthrographic findings alone.

Our impression is that no single factor played a predominant role in patient management.

Our arthrograms did help in managing some of the patients, but the final outcome of each individual management was determined equally by arthrographic, arthroscopic, surgical and clinical findings taken together.

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