CHRONIC OVERUSE INJURIES OF THE PISO-TRIQUETRAL JOINT IN RACQUET GAME PLAYERS

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ABSTRACT

Three squash racquets and one badminton player presented with pain in the base of the hypothenar eminence, due to minor degrees of subluxation of the pisiform bone. Two of them also showed chondromalacia of the articular cartilage of the pisotriquetral joint. All four patients were relieved by excision of the pisiform bone and had returned to their normal daily and sporting activities within three months of their operation.

INTRODUCTION

During the past ten years a variety of pathological conditions has been seen in both racquet game players and less active patients with symptoms attributed to injury or disease in the pisiform bone or the pisotriquetral joint. In my series, there were nine fractures, four cases of chondromalacia, three of osteoarthritis, three dislocations, two of pre-pisiform bursitis, single cases of rheumatoid arthritis, synovial chondromatosis, osteochondritis dissecans, and intraosseous ganglion; a total of 25. Several other patients, including four players of racquet games, have displayed lesser forms of instability.

THE PISIFORM BONE

This small bone is a sesamoid bone which develops within the dorsal fibres of the tendon of the flexor carpi ulnaris muscle. It is connected by ligaments to the hamate, triquetral and fifth metacarpal bones, and provides an important attachment for the proximal portion of the flexor retinaculum. From it arises one muscle, the abductor digit minimi. An immediate relation is the ulnar nerve, accompanied by the ulnar artery, both on the radial side, and too easily damaged during excision of the bone, unless care is taken to identify this neurovascular bundle.

CLINICAL FEATURES

When there is pain, swelling or loss of function on the ulnar aspect of the carpus, care should be taken to examine the inferior radio-ulnar joint, the triangular shaped cartilage attached to the ulnar styloid process, the medial collateral ligament of the wrist joint, the pisotriquetral joint, the pisiform bone and its attached muscles, especially flexor carpi ulnaris. Pain on palmar flexion with resisted ulnar deviation may be due to injury or disease of the pisiform bone as well as tendinitis of the flexor carpi ulnaris insertion. If there is localised tenderness or swelling over the pisiform, disease or injury can be suspected in this bone. With the wrist flexed and put into ulnar deviation, there should be no movement at the pisotriquetral joint, neither in a longitudinal nor in a side-to-side direction; adventitious movement suggests instability of the joint.

Pisiform instability. Several cases of dislocation of the pisiform have been reported, by Van der Donck in 1899, (quoted by Cohen in 1922) and others subsequently. Immermann (1948) described a case of recurrent dislocation, and I have seen three cases of frank dislocation; a man of 32 who dislocated his elbow as well through falling on to his outstretched arm, reduction of both injuries was successful with full functional recovery. Recurrent dislocation in a woman of 26 required excision of the pisiform; there was no history of acute trauma, but a general joint laxity. A badminton player of 20 suffered from increasing degrees of subluxation, until her pisotriquetral joint became completely unstable, necessitating excision of the pisiform. Apley (1976) also saw a case, a young woman, whose X-Rays are reproduced as Fig. 4.

Racquet player's pisiform. Three squash racquets players and one badminton player all suffered unexplained pain on the ulnar side of the hand and carpus. Two non-athletic middle-aged women had similar symptoms following carpal tunnel release, and Massoumi, in 1977, informed me of this syndrome in a golfer. The only symptom was pain at the base of the hypothenar eminence and the only physical sign that could be elicited in all these cases was abnormal mobility and pain in both axial and transverse directions.

Standard X-Rays of the carpus, including sky-line views, and even arthrography, were all normal, but image-intensification showed up the joint instability in two of the patients.

Case 1. A teenage county squash player complained of pain on the ulnar side of his right "racquet" hand, exacerbated by playing. Injections of steroid into the flexor carpi ulnaris muscle, splintage, and various forms of physiotherapy had all been tried without success during the preceding year. He managed to adapt himself to play left-handed, but similar symptoms appeared on that side also. Both pisiform bones could be moved passively upon the triquetral, producing pain. Repeated wrist movements, both flexion/extension and rotation, gave rise to an ache. The right pisiform was excised and the only abnormality noted was some old
haemorrhage into the pisotriquetral joint. His recovery was rapid and he resumed his squash playing four weeks after operation, regaining his team place in three months and reaching his former standard after six months. He has had no further trouble in the seven years following operation.

Case 2. A man of 22 years of age attributed his symptoms to a new squash racquet with a heavier head. Clinical findings, operation and recovery followed the pattern of case No. 1.

Case 3. A squash player aged 38, and a member of the club's first team, first noticed symptoms when he resumed playing after a year's lay-off through an Achilles tendon injury. In addition to slightly abnormal mobility of the pisiform bone he had marked pain on compression of the bone. Macroscopically at operation, and confirmed histologically, there was marked chondromalacia of the articular surface. He too made a rapid post-operative recovery, and returned to playing after four weeks.

Case 4. She was a 23 year old badminton player, with a mild degree of generalised joint laxity, who suffered recurrent frank dislocation of the pisiform starting without any evident precipitating cause. Macroscopically at operation and subsequent histology confirmed a very chondromalacic articular surface. She too was relieved by removal of the pisiform bone.

All four patients have been followed up for 18 months post operatively. None have had any late complications or late symptoms.

OPERATIVE PROCEDURE FOR EXCISION OF THE PISIFORM

A slightly curved excision is made over the pisiform in the axial plane, and it is possible to shell the bone out by sharp dissection without disturbing the continuity of the flexor carpi ulnaris tendon. As the ulnar nerve, including its deep branch, and the radial artery lie close to the radial side of the bone, great care must be taken to avoid damaging them (Helal 1978).
Fig. 4. A case of dislocation of the pisiform. Left — dislocated. Right — reduced. Case 4.

Fig. 5. Chondromalacia of pisiform excised from a lady badminton player. Case 4.

Fig. 6. Incision for pisiform excision.

Fig. 7. a) Position of hand and wrist at start of forehand drive. b) Position of hand and wrist at the end of forehand drive. The torque imparted to the pisiform is exaggerated by the leverage of the racquet.
PROBABLE MECHANISM

There appears to be a torsional stress upon the capsule of the pisotriquetral joint by repeated sharp pronation and supination movements at the wrist when wielding a racquet. The weight of the racquet head adds to the leverage upon the joint in those games where the stroke is made from the wrist. Although tennis racquets are heavier, strokes are made from the shoulder, and pisiform lesions are unlikely to occur.

Particularly when symptoms are referred to the ulnar side of the hand and wrist, examination of the pisiform and its attachments should never be omitted.

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