Osteoarthritis (OA) is a common condition that affects all the joints of the hand. It is estimated that the prevalence of hand pain is between 12% and 21% in the general population; in the elderly much of this is because of OA. In the hand, OA should be thought of as a syndrome where there is often little correlation between pain and the severity of radiological changes. As many as 70% of female patients over the age of 80 years exhibit radiological changes at the distal interphalangeal joint (DIPJ) but many of these patients with apparently severe arthritis radiologically will have few associated symptoms.

The management of the condition is complex with initial therapy generally being conservative. However, there is a range of surgical interventions available, including arthrodesis and escalating up to total joint arthroplasty.

**Signs and Symptoms**

In primary OA of the hand the DIPJ is the most commonly affected, followed by the proximal interphalangeal joint (PIPJ) and then the metacarpophalangeal joint (MCPJ). The condition develops gradually with advancing age although it is sometimes seen in the younger population. There are many factors that have been shown to be associated with OA of the hand, but the exact aetiology has not yet been elucidated. A family history is often present and this is especially true for younger patients. Causes of secondary OA include a history of trauma, gout, soft-tissue laxity and immunological changes. Whatever the causative factor, the result is destruction of the articular cartilage associated with little inflammatory response within the surrounding soft tissues.

The symptoms associated with OA of the hand are variable. Pain is often the presenting complaint because of an inflammatory synovitis early on in the disease process. There is gradual onset of deformity and loss of function as the OA progresses. Over time, pain may become less of a feature, with deformity being the major complaint. Stiffness and diminished strength are also common findings.

Osteoarthritis of the hand is strongly associated with the formation of Heberden’s nodes at the DIPJ and, more rarely, Bouchard’s nodes at the PIPJ. These are clinically obvious localised lumps of uncertain origin. They appear in two varieties, those lateral to the joint line and those in the midline over the joint. Midline nodes have been shown to be traction spurs in the extensor tendon in response to tension or contracture in the structure and are, therefore, not true osteophytes. In contrast, lateral nodes are always associated with true osteophytes, beginning their development as chondrophyses lateral to the joint margin. They grow in the path of least resistance and are of varying morphology around the joint line.

In the general population lateral osteophytes tend to develop most frequently in the dominant hand and are twice as common in the second and third phalanges of the fourth and fifth fingers. These sites correspond to the areas of greatest force as they are used in precision grip.

Ganglion cysts are also associated with OA of the hand. They form when irritated, degenerate, the articular tissue bulges and seals off, thereby forming a cystic structure. Ganglion cysts are most commonly multiloculated, as they develop over time, conglomerating to form a larger structure. They most commonly present on the dorsum of the wrist but can also occur within the flexor tendon sheath. They are called mucous cysts when found around the DIPJ (Fig. 1). Occasionally, ganglion cysts are found within bone when they are called intraosseous cysts; the most common sites are the scaphoid (Fig. 2) and lunate.

**Diagnosis**

The mainstay of diagnosis in OA is the plain radiograph. Ideally, posteroanterior (PA), oblique and lateral views should be obtained. Brewerton views are special views which may also be useful in the assessment of early OA by allowing subtle changes on the metacarpal heads and phalangeal bases to be seen. Brewerton views are taken with the MCPJ flexed to 65°, with the dorsum of the proximal phalanx lying on the cassette and the beam passing 15° from the midline towards the radial side.

*Fig. 1.* Photograph of the clinical appearance of a large mucous cyst of the distal interphalangeal joint.
The radiological changes of OA in the hand are similar to other joints and include joint space narrowing, subchondral sclerosis, cysts and osteophytes (Fig. 3).

In cases where radiological findings are equivocal then an isotope bone scan may show hot spots before plain radiological changes develop. An isotope bone scan may also be positive in early cases of inflammatory arthritis and does not differentiate between that and OA. Similarly, MRI may be used in some patients. It carries the added benefit of demonstrating the integrity of the soft tissues and the articular surface, an important consideration with many arthroplasty options.

**Treatment Options**

Initial therapy is non-operative, with the aim of reducing pain and swelling and delaying further destruction of the joint. Drug therapy for pain can consist of routine analgesia, non-steroidal anti-inflammatory drugs (NSAIDs) being especially useful, although serious side-effects in the presence of gastrointestinal and/or reversible airway disease may limit their use in some patients.

Intra-articular injections of steroid and local anaesthetic can be used to good effect although frequent use is usually avoided as evidence shows there may be chondral toxicity associated with both local anaesthetic and steroid. Indeed, the toxicity of intra-articular steroid is compounded by the presence of local anaesthetic.

When medical therapy fails there are two main surgical options - arthrodesis and arthroplasty.

**Arthrodesis** Arthrodesis fuses the joint in a functional position and is most commonly used in the index and middle fingers, the main function of these digits being with pinching movements. However, fusion of the PIPJ will reduce function in the digit by up to 50%; this may be unsatisfactory to some patients and demand careful counselling and patient selection. It is, however, an effective method of treating patients with significant joint instability associated with arthritis.

Arthrodesis may be effected using screw fixation or tension-band wiring (Fig. 4). Some studies put the rate of nonunion as high as 10% after surgical intervention, although others put rate after tension-band wiring as low as 1%. Should nonunion develop, most cases are asymptomatic, with the development of a fibrous, stable bridge. Other complications of arthrodesis include skin necrosis, cold intolerance, altered feeling and prominence of metalwork.

For functional reasons a fusion is positioned in slight flexion at the DIPJ. At the PIPJ an increasing degree of flexion is preferred, increasing from around 20° at the index finger to 40° at the little finger.

A rare complication of arthrodesis is Quadrigia syndrome which is caused by tethering of the flexor digitorum profundus (FDP) tendon by scar tissue post-operatively. This leads to a variable loss of flexion in all fingers as tethering of one FDP prevents some or all of the FDP tendons from shortening, thereby preventing a full fist from being formed.

**Arthroplasty** The aim of an arthroplasty is to prevent pain but also to retain a useful degree of function in the digit. There are three basic designs of implant; hinged, flexible and resurfacing prostheses. Arthroplasty should be considered early, before the
common feature of OA of the hand. It is especially important that resurfacing prostheses are used early on in the disease process, before deformity is too advanced.

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References