

CASE ONE

Short case number: 3_19_1

Category: Musculoskeletal System & Skin

Discipline: Orthopaedics

Setting: General Practice

Topic: Joint Pain_Osteoarthritis

Case

Graeme Godden, an overweight 59 year male presents with a history of worsening knee pain, his right knee is the most problematic. The pain initially improved with paracetamol, but recently this has not helped and it he is now unable to play a full round of golf without having to stop and rest.

Questions

1. What are the key components of the history in the assessment of Graeme's pain?
2. What are the key components of the physical examination?
3. You inform Graeme that he most likely has osteoarthritis, he asks you what causes osteoarthritis and why is it painful, how would you explain this to him?
4. You organise for Graeme to have an x-ray of his right knee, explain the radiological findings that would support a diagnosis of osteoarthritis.
5. Develop a management plan for Graeme that incorporates pharmacological and non-pharmacological measures?
6. Graeme explains that he does not like taking medications; outline the indications and contraindications to the use of non-steroidal anti-inflammatory medications in the management of osteoarthritis.
7. Graeme mentions that his golf partner had to have a knee replacement for his osteoarthritis and he enquires whether he will eventually need surgery, explain the role of surgery and the surgical options in the management of osteoarthritis.

Suggested reading:

- Solomon L, Warwick DJ, Nayagam S. Apley's Concise System of Orthopaedics and Fractures. 3rd edition. Danvers: CRC Press; 2005.
- Kumar P, Clark ML, editors. Kumar & Clark's Clinical Medicine. 8th edition. Edinburgh: Saunders Elsevier; 2012.
- Signs and Symptoms of Osteoarthritis
http://osteoarthritis.about.com/od/osteoarthritissymptoms/a/signs_symptoms.htm
- Brooks PM. COX-2 inhibitors. Aust Prescr 2000;23:30-2.
<https://doi.org/10.18773/austprescr.2000.034>

Question 1**What are the key components of the history in the assessment of Graeme's pain?**

1. Pain
 - a. Joints affected
 - b. Joint pain
 - c. Joint stiffness
 - d. Joint tenderness
 - e. Limited range-of-motion
 - f. Crepitus (crackling, grinding noise with movement)
 - g. Joint effusion (swelling)
 - h. Local inflammation
 - i. Bony enlargements and osteophyte formation

Pain is the primary symptom of osteoarthritis and is linked to functional impairment and disability in osteoarthritis patients. Usually osteoarthritis pain develops gradually. With mild to moderate osteoarthritis, pain typically worsens with use of the joint and improves with rest. As the disease progresses, pain is usually more persistent and may not be relieved by rest or basic treatments for osteoarthritis.

Other than being a sign of more severe disease, pain at rest can be a sign of local joint inflammation. Morning stiffness is common with osteoarthritis but does not last as long as it does in people with rheumatoid arthritis. Usually morning stiffness in osteoarthritis patients lasts less than 30 minutes

Question 2**What are the key components of the physical examination?****Examination**

1. Inspection
2. Palpation
3. Movement
4. Special Tests

Question 3**You inform Graeme that he most likely has osteoarthritis, he asks you what causes osteoarthritis and why is it painful, how would you explain this to him?**

The aetiology of OA is unknown. Genetic diversity and as yet poorly defined gene defects, developmental variations in anatomy and occupational forces are all thought to contribute to the causation of OA.

OA is considered to be a slowly progressive disease in which the symptoms tend to fluctuate considerably over time.

Osteoarthritis results from articular cartilage failure induced by a complex interplay of genetic, metabolic, biochemical, and biomechanical factors with secondary components of inflammation. The process involves interactive degradation and repair processes of cartilage, bone, and synovium.

Chondrocytes are probably the most important cells responsible for the development of the osteoarthritic process. Human and animal studies indicate that chondrocytes exhibit numerous abnormal metabolic features as part of the osteoarthritis process. These include increased levels of proliferative, synthetic, and degradative activity.

However, the abnormal physiologic responses observed in osteoarthritis cannot be reproduced by any single purified cellular factor. It is therefore likely that a combination of factors present in the joint result in multiple metabolic alterations.

Question 4

You organise for Graeme to have an x-ray of his right knee, explain the radiological findings that would support a diagnosis of osteoarthritis.

X-rays of osteoarthritis do not detect early cartilage abnormalities. Also, x-rays can show mild osteoarthritis while a patient may be experiencing severe symptoms. Conversely, an x-ray may show changes indicative of advanced or severe osteoarthritis while a patient may have few or no symptoms.

Joint Space Narrowing

Osteoarthritis causes deterioration of the joint structures. Wearing away or deterioration of articular cartilage leads to narrowing of the joint space.

Development of Osteophytes

Osteophytes, also called bone spurs, are protrusions of bone and cartilage. The bony projections are commonly seen in areas of a degenerating joint and can be seen on x-rays.

Subchondral Sclerosis

Subchondral bone is the layer of bone just below the cartilage. Sclerosis means that there is hardening of tissue. Subchondral sclerosis is seen on x-ray as increased bone density, frequently found adjacent to joint space narrowing.

Subchondral Cyst Formation

Subchondral cysts are fluid-filled sacs which extrude from the joint. The cysts contain thickened joint material, mostly hyaluronic acid. Traumatized subchondral bone undergoes cystic degeneration.

Subluxation

Subluxation is a partial dislocation of a bone.

Question 5

Develop a management plan for Graeme that incorporates pharmacological and non-pharmacological measures?

Nonpharmacologic Modes of Treatment for Osteoarthritis

- Education about objectives of treatment and self-management through lifestyle modifications
- Aerobic, muscle-strengthening, and water exercise
- Weight reduction
- Walking aids
- Referral to a physical therapist
- Footwear and insoles
- Thermal Treatment

Pharmacologic Treatments for Osteoarthritis

- Oral NSAID's
- Topical NSAID's – slow absorption only
- Weak opioids and narcotic analgesics for refractory pain (resistant to ordinary treatment)
- Intra-articular (into the joint) injections of corticosteroids - ineffective
- Glucosamine and/or chondroitin sulfate for symptom relief
- Glucosamine sulfate, chondroitin sulfate, and/or diacerein for possible improvement in joints and surrounding structures

Question 6

Graeme explains that he does not like taking medications; outline the indications and contraindications to the use of non-steroidal anti-inflammatory medications in the management of osteoarthritis.

The benefits of physical therapy in the treatment of osteoarthritis should not be underestimated. When considering anti-inflammatory medication one must consider the benefits and disadvantages of conventional NSAID's and selective COX 2 NSAID's.

COX2 Selective NSAIDS are no more effective than conventional NSAIDS. In clinical trials to date celecoxib and rofecoxib are no more effective in relieving pain than the conventional NSAID's such as ibuprofen, diclofenac.

COX – 2 Selective NSAIDS have the same range of side effects as conventional NSAID's. The COX – 2 selective NSAID's may have a slightly slower risk of adverse gastrointestinal side effects although this benefit varies depending on the population group, so the absolute benefit is questionable. Otherwise the adverse side effect profile is similar so all NSAID's should be used with caution in patients with renal or cardiac disease.

Yu, S.P., Hunter, D.J. (2015) Managing Osteoarthritis. Australian Prescriber (38) 115-19 DOI: 10.18773/austprescr.2015.039 <https://www.nps.org.au/australian-prescriber/articles/managing-osteoarthritis#nsaids>

Question 7

Graeme mentions that his golf partner had to have a knee replacement for his osteoarthritis and he enquires whether he will eventually need surgery, explain the role of surgery and the surgical options in the management of osteoarthritis.

Surgical Treatments for Osteoarthritis

Total joint replacement

- Unicompartmental knee replacement
- Osteotomy and other surgical procedures to preserve joints and unload the affected site.
- Joint fusion after joint replacement has failed – rarely done at all today
- Joint lavage (wash out) and arthroscopic debridement in knee osteoarthritis – no proven efficacy

Complications with Joint Replacement Surgery

- infection
- blood clots
- loosening of the prosthesis
- dislocation
- nerve or blood vessel injury near prosthesis
- problems with anaesthesia
- Wound irritation or breakdown.
- Wear of joint.

Benefits of Joint Replacement Surgery

Typically, patients who have had joint replacement surgery return to normal daily activities and function well. Patients who participated in sports before needing surgery likely can participate in low-impact sports following surgery.

Physical therapy and a committed rehabilitation program are important to a successful outcome for surgery. The outcome and speed of recovery following joint replacement surgery depend on:

- Activity level before surgery
- Overall general health
- Severity and duration of physical impairment before surgery
- Type of surgery (i.e., cemented, non-cemented, minimally invasive)
- Attitude toward recovery and motivation