Understanding the Pathophysiology of Osteoarthritis

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Osteoarthritis Pathophysiology

Did you know that osteoarthritis is the most common type of arthritis? When people talk about arthritis, it is typically in reference to OA, which causes pain and swelling of the joints. In this article we will explore osteoarthritis pathophysiology. Here's all you need to know.

What is Pathophysiology?

It's a long and complex word, so let us break it down for you. Essentially, pathophysiology is the study of changes and/or symptoms that are specific to a certain disease. In this case, we will relate it to OA.

Pathophysiology of Osteoarthritis Explained

The pathogenesis of osteoarthritis involves the breakdown of cartilage at the specific joint. It can also involve the remodeling of bone.

Inflammation of the joint causes the release of enzymes, which, in turn, breaks down collagen and proteoglycans. The breakdown of these tissues destroys joint cartilage. When the collagen, proteoglycans, and cartilage eventually breakdown, the underlying bone is exposed, causing it to be remodeled into painful cysts and osteophytes (bone spurs).

Eventually, the bone space of the joint is lost.

Clinical Features of Osteoarthritis

Osteoarthritis typically affects the joints of the hips, knees, and the small bones of the hands and feet. Clinical features are objective symptoms that can be observed by a healthcare provider, as well as subjective symptoms commonly reported by you, who may be suffering from osteoarthritis.

The most common clinical features include:

- Pain and stiffness of the affected joint (pain typically worsens throughout the day and stiffness typically improves throughout the day)
- Pain that worsens with activity and is relieved by rest
- Deformity of the joint, as well as reduced range of motion, though these typically occur when the osteoarthritis has progressed over a period of time
- Heberden's nodes (bony bumps on the finger joint that is closest to the fingertip) and/or Bouchard's nodes (bony bumps on the middle finger joint) may be present on the joints of the hands
- Crepitus may be felt and heard on palpation of the joint; crepitus is a crackling feeling and sound

Differential Diagnoses

A differential diagnosis is when a doctor seeks to differentiate one medical condition from another. In the case of osteoarthritis, the goal is to differentiate osteoarthritis from other types of arthritis, such as rheumatoid arthritis.

Inflammatory Arthritis

If pain is felt in numerous joints, such as the wrist, elbow, and ankle, it is less likely to be osteoarthritis and more likely to be an inflammatory arthritis. Though osteoarthritis can occur in numerous joints, especially if associated with a sports injury or an occupation, it is typically localized to a single joint.

When differentiating between an inflammatory arthritis and osteoarthritis, an arthrocentesis may be performed.

Other Diagnoses

Pain that is associated with other symptoms typically indicates something more significant. For example, when pain at a joint is also experienced with weight loss, loss of appetite, fatigue, and fever, rheumatoid arthritis, lupus, polymyalgia rheumatica, sepsis, or a malignancy must be suspected.

Joint-Specific Differential Diagnoses

When working towards a diagnosis of osteoarthritis, your doctor will also likely keep in mind the joint that is affected. This is because certain conditions may occur in certain joints. They will look for:

- **Knee:** referred hip pain, meniscus tears, chondromalacia patellae
- **Hand:** gout, rheumatoid arthritis, De Quervain's tenosynovitis
- **Hip:** trochanteric bursitis, radiculopathy, iliotibial (IT) band syndrome, spinal stenosis

Treatment of Osteoarthritis

There is no cure for osteoarthritis, but the symptoms can be managed. Let's explore a few options below.

Medication

A variety of medications can be useful in treating the pain and inflammation of osteoarthritis:

- **Analgesics:** pain relievers, such as opioids and acetaminophen. Acetaminophen can be purchased over the counter (OTC). Opioids and other analgesics must be prescribed by a provider.
- **Nonsteroidal anti-inflammatory drugs (NSAIDs):** treats both pain and inflammation and are typically purchased OTC, though a provider may prescribe a strong strength as a prescription. Examples include ibuprofen, naproxen, aspirin, and celecoxib.
- **Counterirritants:** topical creams that irritate the nerve endings, causing feelings of warmth or coolness to distract from the pain. They may include lidocaine, menthol, or capsaicin.
- **Corticosteroids:** medications that reduce inflammation and are prescribed as an oral medication or injected directly into the joint.
- **Platelet-rich plasma (PRP):** given as an injection and contains proteins that reduce pain and inflammation.

Lifestyle Management

Your doctor will typically recommend various lifestyle management strategies to reduce pain, in conjunction with recommended medications.

Exercise helps to relieve pain by strengthening the joint, reducing weight, and improving range-of-motion. An exercise plan should include the following:

- Strengthening exercises
- Range-of-motion exercises
- Aerobic exercise
- Balance exercises

Weight loss helps to reduce the stress on the joints. Exercise can cause additional stress on the joints, causing pain and inflammation.

Physical therapies, such as occupational therapy, physical therapy, and chiropractic care can reduce pain, ease range of motion, allow for the use of assistive devices, and allows for you to learn exercises that can improve the health of your joints.