Review Article

Degenerative disc diseases: A Brief Review

Abstract:

Back pain of different etiology is a common encountered symptoms in daily practice. Several factors were associated with the development of degenerative disease (DDD) of the intervertebral disc(IVD).

The intervertebral disc, usually asymptomatic but once became symptomatic it will be presented as a low back pain with is consider the main complain among the patient with IVD. Both genetic as well as environmental factors lead to progressive redaction in extracellular matrix (ECM) composition which resulted overtime in weak IVD. Clinically back pain divided into two main categories: Inflammatory versus mechanical back pain, DDD typically present with mechanical type lower back pain.

In patient with compatible history and physical exam findings, diagnosis of DDD can be confirmed by computed tomography (CT) scan, magnetic resonance imaging (MRI), or provocative discography.

The DDD can be manage with several treatment strategies such as conservative therapy which aim to relief the pain, on the other hand, surgical approach which aim to definitely treat the DDD. The current study aims to provide a brief review about degenerative disc diseases.

Key words: , lower back pain , lumbar disc diseases, lumbar degeneration, management.

Introduction:

Back pain of different etiology is a common encountered symptoms in daily practice. Several factors were associated with the development of degenerative disease (DDD) of the intervertebral disc(IVD). (1) It is a common condition characterized by the breakdown (degeneration) of one or more of the discs that separate the bones of the vertebrae in response to several factors such as aging, repeated trauma or chronic inflammatory condition , clinically this degeneration presented as back or neck pain. The intervertebral disc, usually asymptomatic but once became symptomatic it will be presented as a low back pain with is consider the main complain among the patient with IVD. (1, 2). The intervertebral discs IVD cushion the vertebrae and absorb pressure on the spine. (2). Both young and old people can be affected by IVD disorders. Many management strategies are used to treat DDD, before considering the appropriate treatment strategy multiple factors should be considered such as patient age at presentation, present of co-morbid condition as well as disease severity.

Objective:

The current study aims to provide a brief review about degenerative disc diseases.

Pathophysiology:

Both genetic as well as environmental factors lead to progressive redaction in extracellular matrix (ECM) composition which resulted overtime in weak IVD (5).

A decrease in nutrient supply resulted in a low PH state and reduction of oxygen concentration which has been shown to negatively impact the IVD in its function to maintain the ECM. (6, 7).

Aging changes the proportion of chondroitin-4-sulfate to chondroitin-6-sulfate, as well as the proportion of chondroitin-4-sulfate to chondroitin-6-sulfate, with a corresponding decrease in water content. Proteoglycan synthesis decreases, which reduces osmotic swelling and oxygen and nutrient traffic to the disc. As a result of the reduced traffic, breakdown products of link and non-collagenous proteins accumulate in the disc. The

brown discoloration of ageing connective tissues is caused by nonenzymatic glycosylation of these breakdown products (6).

Although genetics appear to be one of the strongest risk factors to develop DDD, other factors also contributing in accelerating the rate of degeneration such as endplates calcification as well as inadequate nutrition inhibits (8).

Diagnosis:

Degenerative disc disease must be listed in the differential diagnosis of back pain, in patient with compatible history and physical exam findings, diagnosis of DDD can be confirmed by various diagnostic studies such as lumbar radiographs, computed tomography (CT) scan, magnetic resonance imaging (MRI), or provocative discography(9, 10).In patient diagnosed with DDD, a clinical response to treatment trial also aid in confirming the overall diagnosis of DDD (11).

While both MRI and CT scanning can be used to assess the spinal canal , bony alignment and the lumbar facets, MRI scan also allows for direct assessment of the neural and disc structures. In patient whose clinical presentation compatible with DDD, and radiological image (radiography and MRI) did not show any abnormality can explain patients' symptoms, provocative discography can be used to confirm the presence of DDD.(12,13)

Radiographs in contrast with both MRI and CT scan only evaluate the anatomical structure without assessment of disc, also radiograph may miss the early degenerative changes(14).

Management:

1. Conservative Therapy:

The conservative therapy (non-surgical treatment strategy) contestant of non-pharmacological therapy in form of physical exercise which strength the paraspinal muscle which intern reduce the pain, an exercise program of 4 to 6 weeks duration can

be help majority of the patients (15).The pharmacological part of the conservative management consistent of pain control medication such as nonsteroidal anti-inflammatory drugs (NSAIDs), paracetamol, and muscle relaxants(baclofen) (16). Finally, temporary pain relief can be achieved with injection of the targeted area.(17)

2. Percutaneous Intervertebral Disc Techniques (Reconstructive Strategies):

The aim of reconstructive strategy relief the direct compression and the irritant from the targeted nerve, different decompression techniques were used such as thermal decompression (via lasers or radiofrequency probes), chemical (chymopapain) and mechanical (18, 19).

oxygen–ozone mixture and radiopaque gel-like ethanol both used in chemical decompression with immune modulating effect (20).

3. surgical management:

Several surgical interventions used to treat DDD, the optimal approach still a sourced of controversy (21). Surgery is indicated urgently in patient who develop acute neurological deficit (22). Among the remaining majority of the patients with chronic back pain, with supportive radiological finding of disc degeneration, surgery is indicated in those who fail the conservative management(23,24).

Conclusion:

Degenerative disc disease, one of the most common cause of lower back pain. Development of DDD linked to several factors such as genetic. There are three major treatment options; Conservative therapy with exercise and pain relief medication can be used initially, if failed more definitive therapy can be achieved through the surgical strategies.

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