

Acknowledgment

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Summary

Modic changes are bone marrow and endplate changes adjacent to degenerative lumbar intervertebral discs. Three different Modic types (I, II, and III) were initially described by Modic¹.

Since then, mixed Modic lesions (I/II and II/III) have been identified, suggesting that all Modic changes can progress from one type to another and that they all present different stages of the same pathologic process. A prevalence of 22% to 50% of disc levels affected by Modic changes has been observed in patients with degenerative intervertebral disc disease^{1,2}.

The association of Modic changes with clinical symptoms has been evaluated in several studies. Toyone *et al* found an association between Modic Type I change and low back pain ⁷⁵.

Mitra *et al* found a positive trend between the evolution of Type I to Type II change and symptom improvement. These authors also think that Type I is painful, at least at

some stage of the process. The etiology of Type I change remains unclear. It has been suggested that repeated trauma to the intervertebral disc results in upregulation of inflammatory mediators in the nucleus pulposus. Diffusion of such toxic chemicals through the vertebral endplates could then result in a local inflammatory reaction resulting in low back pain⁶⁶.

Vital *et al* suggested that Modic Type I changes appear to be a good indicator of satisfactory surgical outcome after arthrodesis. However, it is probably premature to assume that Modic changes are themselves indicative of need for a specific intervention⁶⁷.

List of Abbreviation

FOV	Field of vision
Gd	Gadolinium
HIZ	High intensity zone
HZ.....	Hertz.
IL	Interleukin
L	Lumbar
MMP	Metalloproteinases
MRI	Magnetic resonance image
MT	Modic type
S.....	Sacral
SE	Spin echo
STIR	Short TI recovery magnetic resonance spectroscopy
TNF	Tumor necrotic factor
TSE.....	Turbo spin echo
NPV.....	negative predictive value
PPV.....	positive predictive value
TNF.....	tumor necrosing factor
SI.....	signal intensity
WI.....	weighted image

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دور تغيرات موديك في تشخيص و علاج تآكل غضاريف الفقرات القطنية

رسالة

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Role of Modic Changes in Management of Degenerative Lumbar Spine

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الملخص العربي

تمثل الصفائح الإنتهائية الفقارية أحد الأسباب المحتملة لآلام أسفل الظهر ذات الأصل الغضروفي. وباستخدام أشعة الرنين المغناطيسي تبين وجود تغييرات الصفائح الإنتهائية (تغيرات موديك) بنسبة 20-50% من المرضى الذين يعانون من آلام أسفل الظهر. وهكذا فإن تغيرات موديك تعتبر نسبياً علامة نوعية وإن كانت غير حساسية لآلام الغضروف القطني.

تغيرات موديك هي إصابات في النخاع العظمي للصفائح الإنتهائية الفقارية تلاحظ في أشعة الرنين المغناطيسي. هذه التغيرات اكتشفت أول الأمر سنة 1980 في 22-25% من المرضى الذين يعانون من أمراض تأكل غضروف ما بين الفقرات.

تعتبر تغيرات موديك هي العنصر الحاسم في العملية التآكلية حول الغضروف. وهناك ثلاثة أنواع:

- النوع الأول: يفترض أنه يمثل عملية تحلل نشط مستمر.
- النوع الثاني: يعتقد أنه يمثل عملية ثابتة ومزمنة وتعكس عملية تحلل دهني للنخاع العظمي.
- النوع الثالث: يفترض أنه يتناسب مع تصلب العظام تحت الغضروفي.

وهناك اقتراح حول موديك من الأعراض الإكلينيكية تم تقييمها في كثير من الدراسات. وقد اكتشفوا العلاقة بين النوع الأول وآلام أسفل الظهر وأقروا أن 37% من النوع الأول و 11% من النوع الثاني لهم علاقة بآلام أسفل الظهر.

INTRODUCTION

Magnetic resonance imaging has achieved a high degree of accuracy in detecting morphologic changes in the spine due to aging and degeneration. Modic changes constitute the crucial element in the degenerative process around the disc in relation to low back pain¹.

Three types of Modic lesions are identified:

- Type 1 lesions: indicate an ongoing active degenerative process.
- Type 2 lesions: are thought to manifest a more stable and chronic process reflecting fatty degeneration of bone marrow.
- Type 3 lesions: are thought to correlate with subchondral bone sclerosis¹.

Mixed modic changes lesions, type 1 and type 2, also type 2 and type 3, have been identified².

Mixed modic changes lesions, type 1 & type 2, also type 2 & type 3, have been identified¹.

Modic type 1& type 2 are interchangeable & equipotent in generating capacity, a fact that may more reflect their associated endplate changes².