Free Disc Fragment : A Retrospective Case Analysis†

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Abstract

Preoperative diagnosis of free disc fragment is important in order to avoid treatment by chymopapain and percutaneous method of disc removal or anterior discectomy. This retrospective case analysis was to study the cause, physical findings and appropriate investigation to identify free disc fragment before surgery. One hundred and thirteen operative patients of herniated lumbar disc were studied. Of these, eleven patients (9.7%) were diagnosed with free disc fragment. The results revealed that one patient was diagnosed preoperatively with free disc fragment by myelography and MRI and three other patients using MRI alone. We concluded that preoperative diagnosis of free disc fragment can be made through identification of a large myelographic defect and/or sagittal scan MRI showing migration of disc material from native disc space.

Key word : Free Disc Fragment, Herniated Lumbar Disc

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Free disc fragment refers to disc material that has migrated away from a contiguous position with native space.

In 1994, Yamashita et al used Gadolinium diethylenetriamine penta-acetic acid (Gd-DTPA) enhanced magnetic resonance imaging (MRI) to increase the certainty of preoperative diagnosis of free disc fragment that migrated caudally away from the L_5-S_1 disc space in a 37 year old man who had developed spinal nerve root compression[1]. In 1995, Prestar and Schattke reported three cases of intradural lumbar disc herniation. They stated that by multiplanar MRI, the free disc fragment within the dural sac may be shown preopera-

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tively[2]. Identification of a free disc fragment is important because otherwise the surgery may be more extensive than necessary and chymopapain injection and percutaneous method of disc removal or anterior discectomy will be contraindicated[3-5].

This paper was to study the cause, physical findings and appropriate investigation to identify free disc fragment before surgery in our patients.

MATERIAL AND METHOD

From June 1, 1986 - May 31, 1998, one hundred and thirteen cases of posterior discectomy for herniated lumbar disc were performed and eleven of these cases (9.7%) were found to have free disc fragment. We reviewed 11 consecutive free disc fragments, looking at the history, clinical findings and investigation. These included age, sex, onset of symptoms, cause and location of pain, progression of symptoms, nerve root tension findings, neurologic signs, myelography and MRI.

RESULTS

The age of the eleven cases ranged from 29-76 years with an average age of 44.5 years. Nine patients were male and the remaining two patients were female. These patients suffered from low back pain and sciatica of 3 days to 3 months' duration. Trauma was the cause of this ailment in one case (9.1%) and from lifting in four cases (36.4%). Low back and leg pain were common symptom in ten cases (90.9%) and one case (9.1%) complained of low back and thigh pain. In one of these eleven cases (9.1%), the pain was intractable and was relieved by surgical operation. Five cases (45.5%) exhibited grade $^4/_5$ motor weakness of the toes and the straight leg raising test was positive in seven cases (63.6%).

Investigation in these cases showed that findings by myelography and MRI identified free disc fragment in one case (9.1%) and MRI alone identified three other cases (27.3%). In the remaining seven cases (63.6%), free disc fragment was found during the surgical operation.

DISCUSSION

In 1991, Ballard et al used CT scans to diagnose a high lateral free disc fragment at the exit foramina of L_5 nerve root in a 47 year old lady who suffered from right lower extremity pain with weakness in the L_5 myotomes. Myelogram is characteristically normal in these cases[6].

Free disc fragment ruptures through the anulus and comes to lie between it and the posterior longitudinal ligament, between this ligament

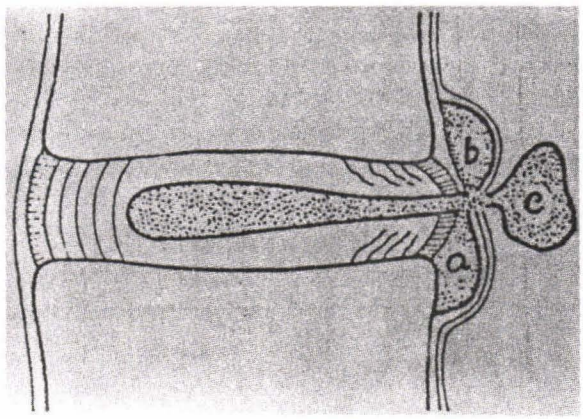
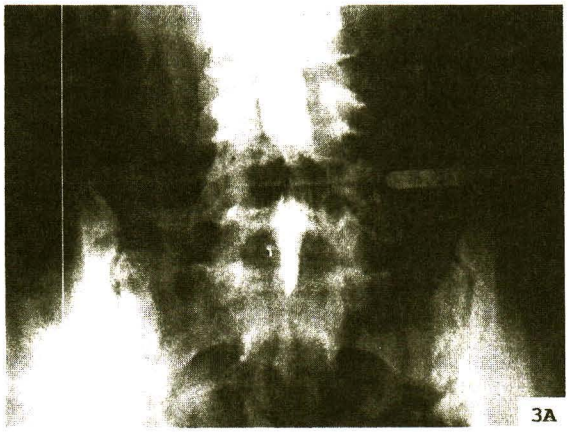


Fig. 1. Diagramatic representation of free disc fragment refers to nucleus pulposus material that has migrated under the posterior longitudinal ligament (A), between ligament and dura (B), or through dura (C).

Fig. 2. T_1 W sagittal scan (SE 600/38) showing large disc herniation at L_5-S_1 with disruption of anulus-ligament complex and migration of disc fragment down posterior aspect of S_1.



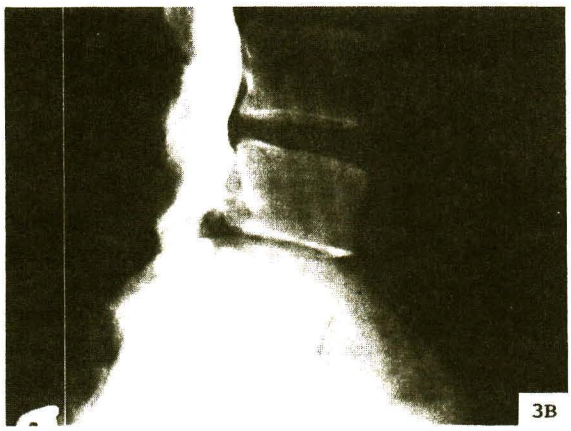


Fig. 3. A, B. Myelogram in AP (A) and lateral (B) clearly showing L_4-L_5 disc herniation but with no evidence of free fragment arising from L_3-L_4 disc space.

and dura, or within the dural sac (Fig. 1). The separated or free fragment may migrate in a cephalad, caudad or lateral direction and is often sequestrated within the canal at a different location.

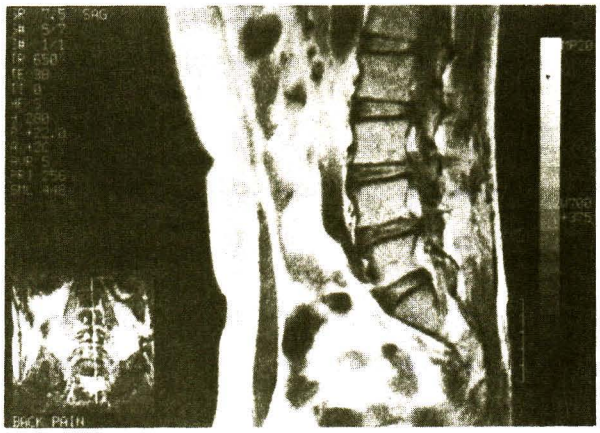


Fig. 4. T_1 W sagittal scan (SE 650/38) showing disc herniation at L_4-L_5 and a free disc fragment arising from L_3-L_4 that migrated away from the disc space.

In our series, looking at all aspects of the patient's history and physical examination offered no clue as to whether or not the disc was a free fragment.

Free disc fragment is best detected on MRI sagittal scans showing migration from native disc space along the dorsal surface of the adjacent vertebral bodies. Such free disc fragments are seen on axial scans but their separation from the disc space is best appreciated on the sagittal scan (Fig. 2). The free fragment disc material often is still hydrated and thus shows relatively high signal intensity on a T2W image[4].

Free disc fragment can present without myelographic findings (Fig. 3A, B). However, MRI can also show a large disc herniation at L_4-L_5 with a free fragment arising from L_3-L_4 disc space that migrated away (Fig. 4).

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ชิ้นดิสค์อิสระ : การศึกษาย้อนหลัง†

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การพิเคราะห์โรคก่อนผ่าตัดได้ว่าเป็นชิ้นดิสค์อิสระ มีความสำคัญ เพื่อหลีกเลี่ยงการรักษาด้วยการฉีดคัยโมพาเพน และการเจาะดูดดิสค์ออกทางผิวหนัง หรือผ่าตัดดิสค์ด้านหน้า

เราได้ศึกษาคนไข้ที่ได้รับการผ่าตัดดิสค์ส่วนเอวด้านหลัง 113 ราย ซึ่งมี 11 ราย (9.7%) เป็นชิ้นดิสค์อิสระ โดย 1 ราย สามารถพิเคราะห์โรคได้ก่อนผ่าตัด จากมัยอีโลกราฟี และเอ็มอาร์ไอ อีก 3 ราย พิเคราะห์โรคได้ก่อนผ่าตัด จากเอ็มอาร์ไออย่างเดียว

จากการศึกษานี้ สรุปได้ว่า การพิเคราะห์โรคเป็นชิ้นดิสค์อิสระได้ก่อนการผ่าตัด โดยพบรอยผิดปกติใหญ่ในมัยอีโลแกรม และหรือแซจิททอลเอ็มอาร์ไอ แสดงชิ้นดิสค์อิสระเคลื่อนจากตัวดิสค์

คำสำคัญ : ชิ้นดิสค์อิสระ, ดิสค์ส่วนเอวเคลื่อน

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