

**MRI EVALUATION OF PATTERN OF DISC DISPLACEMENT OF TEMPOROMANDIBULAR JOINT IN UNILATERAL TEMPOROMANDIBULAR JOINT PAIN AND COMPARISON WITH CONTRALATERAL ASYMPTOMATIC TEMPOROMANDIBULAR JOINT**

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**ABSTRACT:** Temporomandibular joints (TMJ) are a pair of synovial joints on both side of head, which helps in movement of mandible resulting in speech, facial expression & mastication. Internal derangements of TMJ are the common causes of non-traumatic pain around TMJ. There are few studies concerning this finding and MRI evaluation of TMJ in establishing the diagnosis.

**AIMS & OBJECTIVES:** The purpose of this study is to evaluate the relationship of internal disc displacement and pattern of disc displacement with the painful TMJ using MR Imaging of painful TMJ.

**RESULTS:** We imaged 30 TMJ of 15 patients with unilateral TMJ pain and the symptomatic TMJ was compared with asymptomatic TMJ. The position of disc was noted for both painful & asymptomatic side.

**DISCUSSION:** In our study we imaged 30 TMJs using MRI. For all the 15 study participants, the painful TMJ was compared with contralateral asymptomatic joint. We found that anterior, anteromedial & anterolateral disc displacements were associated with TMJ symptoms, however the superior displacement was found to be asymptomatic. **CONCLUSION:** The anterior, anterolateral and anteromedial displacement of disc of TMJ is commonly associated with TMJ pain. However the superior displacement was asymptomatic. MRI is very useful in evaluating painful TMJ by assessing the disc displacement and associated findings. However the long-term association and remission of symptoms of disc displacement needs further evaluation.

**KEYWORDS:** Painful TMJ, disc displacement, MRI.

**INTRODUCTION:** Temporomandibular joints (TMJ) are a pair of synovial joints on both side of head, which helps in movement of mandible resulting in speech, facial expression & mastication. A painful TMJ is a common clinical situation, the evaluation of which helps in treating the symptoms of the patient.<sup>[1]</sup> Internal derangements of TMJ are the common causes of non-traumatic pain around TMJ. This includes disc displacement, joint effusion and synovial thickening. These derangements within the TMJ are associated with pain in the TMJ, clicking and/or crepitation, headaches and limitations of jaw opening. A displaced disc is the most common cause of painful TMJ. However the question of whether the disc displacement can be linked to the onset, progress of TMJ related signs and symptoms remains a point of controversy.<sup>[2]</sup>

Temporomandibular joint effusion & synovial thickening are seen in disc displacement in addition to other joint disorders like inflammatory diseases, alteration in joint pressures, trauma and infections. There are few studies concerning this finding and MRI evaluation of TMJ in establishing the diagnosis & follow up of cases of temporomandibular disorders (TMD).<sup>[2]</sup> The purpose of this

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study is to evaluate the relationship of internal disc displacement and pattern of disc displacement with the painful TMJ using MR Imaging of painful TMJ.

**AIMS & OBJECTIVES:** To study the MRI findings of disc displacement and pattern of disc displacement in painful TMJ and its association with pain around TMJ.

**MATERIALS & METHODS:** The 30 TMJs of 15 patients with unilateral TMJ pain were our study participants. All these were the patients with unilateral painful TMJ referred for MRI evaluation of TMJ to the department of Radiology of Yenepoya Medical College, Deralakatte, Mangalore during the study period of six months. For each of the 15 patients both TMJ were imaged. The painful TMJ was compared with contralateral asymptomatic TMJ. Those patients with previous history of trauma, surgery to TMJ and those who presented with bilateral symptoms will be excluded. Also the patients with general contraindications for MRI are also will not be included in the study.

The selected patients underwent MR imaging of both TMJ with 0.4 T MR Scanner (APERTO, Hitachi, Singapore) and a dedicated circular polarized transmit and receive TMJ coil. The data were collected on a 1024×1024 matrix with a field view of 350mm. With the patient in supine position minimum of 2 paracoronal and 2 parasagittal slices were obtained of each TMJ. The clinical data & MRI findings were tabulated & analyzed. The relationship between the pain & the internal derangements of the joint were analyzed.

**RESULTS:** We imaged 30 TMJ of 15 patients with unilateral TMJ pain. The symptomatic TMJ was compared with asymptomatic TMJ. For each symptomatic TMJ, the same patients contralateral TMJ was used as control. Out of 15 patients, 4 (26.7%) were males & 11 (73.7%) were females (Figure 1). We studied the position of disc and documented as anterior, anteromedial, anterolateral & superior. The position of disc was noted for both painful & asymptomatic side. In all the symptomatic TMJ the disc was displaced either anterior or anteromedial or anterolateral, but superior displacement was asymptomatic (Figure 2). Whereas on asymptomatic side, there was no disc displacements to anterior or anteromedial or anterolateral direction. It was either no displacement or only superior displacement.

**DISCUSSION:** Dolwick MF et al evaluated the relationship of disc position to pain, mandibular dysfunction & considers the clinical significance of disc displacement.<sup>[1]</sup> Hall HD et al featured the relationship of disc displacement to dysfunction, osteoarthritis and mandibular growth disturbances but is unclear between the relationships of disc displacement to pain.<sup>[2]</sup> Sano T et al have found that while disc displacement maybe a cause of pain, inflammation is clearly another cause. Their study concludes by saying that further research remains to be done before the role of disc displacement for cause of pain to be justified as the primary pathologic factor.<sup>[3]</sup>

Another study reports about disc displacement and pain, disc displacement and skeletal deformity and disc displacement and mandibular growth and concludes that a normally positioned and functioning disc is a necessary component of an optimally healthy TMJ.<sup>[2]</sup> Another study was based on 48 joints in 33 patients referred for MRI of the TMJ.<sup>[3]</sup> The purpose of their study was to analyze a possible association between pain and T2 signal intensity from the retrodiscal tissue on MRI.

The T2 signal from the retrodiscal tissue was measured on the MR scanner and was correlated to the degree of pain. The study concludes that the average T2 signal from the retrodiscal tissue is higher in painful joints than in non- painful joints. Their study states this might reflect an

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increased vascularity of the joint tissue.<sup>[3]</sup> Adame CG et al conducted to investigate effusion in MRI of 123 joints.<sup>[4]</sup> The purpose of this study was to co-relate the clinical and imaging features of this phenomenon, the ultimate purpose of clarifying its meaning in dysfunctional processes of the TMJ. The clinical histories of 111 patients with effusion on MRI were reviewed. 31 patients with articular pathology but without effusion in TMJ could be seen in relation to disc displacement and degenerative changes. These results suggest that effusion may be a marker of articular degeneration in the TMJ.

Another study comprised of 41 patients with unilateral pain near the TMJ.<sup>5</sup> Bilateral sagittal and coronals MRI were obtained to establish the presence or absence of TMJ ID or effusion or both. The objective of the study was to investigate the relationship between the presence of TMJ pain & the MRI diagnosis of TMJ ID, TMJ effusion. The study concludes that although clinical pain is co-related with TMJ related MRI findings, clinical pain in and it is not reliable for predicting the presence of TMJ ID or effusion or both. Therefore MRI appears to be a warranted and necessary supplement to the clinical findings.

In our study we imaged 30 TMJs using MRI. For all the 15 study participants, the painful TMJ was compared with contralateral asymptomatic joint. We found that anterior, anteromedial & anterolateral disc displacements were associated with TMJ symptoms, however the superior displacement was found to be asymptomatic.

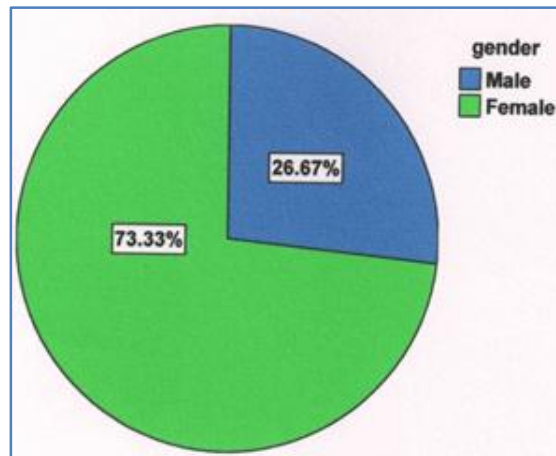
**CONCLUSION:** The anterior, anterolateral, anteromedial displacement of disc of TMJ is commonly associated with TMJ pain. However the superior displacement was asymptomatic. MRI is very useful in evaluating painful TMJ by assessing the disc displacement and associated findings. However the long-term association and remission of symptoms of disc displacement needs further evaluation.

Gender	Numbers
Male	4
Female	11

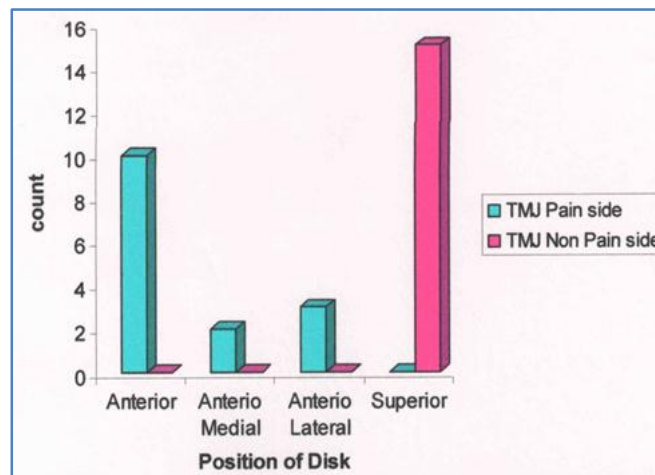
***Fig 1. Shows distribution of cases among both genders***

Position of Disc	PAIN SIDE		NON PAIN SIDE	
	Frequency	%	Frequency	%
Anterior	10	33.3%	00	0%
Anteromedial	02	6.7%	00	0%
Anteriolateral	03	10.0%	00	0%
Superior	00	0 %	15	50%
<b>Total</b>	<b>15</b>	<b>50 %</b>	<b>15</b>	<b>50%</b>

***Fig 2: Table showing the pattern of disc displacement in symptomatic and asymptomatic sides of TMJ***



**Fig. 3:** Showing the distribution of cases of symptomatic TMJ among male & female



**Fig. 4:** Showing the pattern of displacement of discs in painful and painless TMJ.

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