Evaluation of Temporomandibular Joint Internal Derangement

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The incidence of internal derangement of the temporomandibular joint has been documented in patients with temporomandibular disorders. However, the detection and diagnosis of a displacement of the temporomandibular joint disc in relation to internal derangement is not always accurate, and it varies according to the method of examination. A prospective clinical investigation of 26 patients (45 temporomandibular joints) with signs and symptoms of temporomandibular joint pain and dysfunction was completed to examine the accuracy of clinical examination, sagittal recording device tracings, arthrography, and magnetic resonance imaging in detecting internal derangement in the temporomandibular joint. A group of 16 asymptomatic control subjects (32 temporomandibular joints) was examined for the presence of internal derangement by the methods under consideration. Incidence of bilateral internal derangement in the temporomandibular joints of the symptomatic patients was also assessed. Findings obtained through clinical examination and sagittal recording device tracings agreed most often with the arthrographic findings of internal derangement. Magnetic resonance imaging often failed to detect the presence of arthrographically detected internal derangement. Internal derangement was identified bilaterally in a significant number of patients, despite the absence of bilateral symptoms. This incidence varied according to the technique used. In the control group, 9% of the temporomandibular joints that had been assessed as normal according to clinical examination and sagittal recording device tracings were found to have internal derangement according to magnetic resonance imaging.
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The term "temporomandibular disorders (TMD)" embraces a number of clinical problems that involve the masticatory musculature and/or the temporomandibular joint.[1] Internal derangement (ID) is an orthopedic term for disorders causing mechanical disturbances and impediments to joint function, a fault which interferes with the smooth action of a joint.[2] Temporomandibular joint ID has been defined as an abnormal relationship between the meniscus and the mandibular condyle, the fossa, and the articular eminence,[3] and it has been associated with pain in the TMJ, clicking and/or crepitus, headaches, and limitations of jaw opening.[4] Three clinical stages of ID have been outlined: *(1)* painless clicking caused by anterior disc displacement with reduction; *(2)* persistent disc displacement leading to painless locking; and *(3)* painful locking due to inflammation.[2]

Signs and symptoms of TMJ ID affect between 4% and 28% of the adult population, with a higher frequency found in women

(6:1). The factors responsible for this predominance are not known.[5] However, the clinical signs and symptoms of TMJ disc derangement are not considered consistently reliable for accurate assessment of the exact extent of the ID.[5] Thus, imaging techniques, such as arthrography and magnetic resonance imaging (MRI), have been utilized to assist in determining the extent of derangement and managing the dysfunction. These methods are of value in evaluating the internal anatomy and dynamics of the TMJ.[6]

Despite the documented strengths of these popular techniques, there are also some disadvantages. For example, arthrography is an invasive procedure that utilizes ionizing radiation and requires the injection of contrast medium into the compartments of the TMJ.[7] Magnetic resonance imaging is an expensive technique that lacks sensitivity in detecting osseous changes and does not provide real-time dynamic images. As a result, less costly and noninvasive methods of assessment have been developed for use in the diagnosis of ID and treatment of TMD. These include a number of devices that correlate changes in mandibular and condylar movements with joint dysfunction on the basis of condylar path tracings.

Studies of pantographic tracings of condylar movements have reported the ability to discern TMD patients from normal subjects.[8–10] Pantographic tracings of mandibular border movements in patients with TMJ dysfunction have shown that both neuromuscular and articular abnormalities are reflected in the tracing patterns.[11] A positive correlation between changes in condylar path tracings and TMJ dysfunction has been reported in other studies.[8,12] Harper[13] concluded that condylar path tracings represent a noninvasive technique that is able to identify and monitor the functional status of the TMJ in response to surgical orthodontics.

In order to determine the relative ability of the above-noted methods of analysis to identify ID, the following study was undertaken. Essentially, the goals of this study were to:

1. Compare four different methods of assessment of ID (clinical examination, sagittal recording device [SRD] tracings, arthrography, and MRI)
2. Compare three methods of ID assessment (clinical examination, SRD tracings, MRI) to the "gold standard" (arthrography)
3. Assess the incidence of ID in a clinically normal population by the use of clinical examination, SRD tracings, and MRI
4. Assess the incidence of ID in the contralateral or asymptomatic TMJs of patients with ID, using clinical examination, SRD tracings, MRI, and where possible, arthrography

Materials and Methods

Experimental Group

This group (n = 26, 45 joints) was derived from patients presenting at the Mount Sinai Hospital Craniofacial Pain Clinical Research Unit for evaluation and treatment of TMD. Patients must have demonstrated attributes consistent with a clinical diagnosis of ID. Traumatically induced or idiopathic ID were considered equally. The following inclusion criteria were used:

1. History of TMJ click
2. Presence of limited mandibular opening, with or without pain, that has not responded to physiotherapy or other appropriate conservative treatments
3. Absence of or markedly reduced translation on palpation of the "affected" condyle, with or without overtranslation of the opposite "nonaffected" condyle
4. Evidence of mandibular shift toward the side of the affected condyle on opening
5. Presence of only one affected joint, as assessed clinically

Control Group

The control population consisted of 16 individuals (32 joints) who had no evidence or past history of TMD or other degenerative joint diseases. The group was selected from an otherwise healthy population of volunteers and was age- and sex-matched to the symptomatic group.

Clinical Examination

The total populations of both the experimental and control groups were intraorally and extraorally examined, and a medical history was taken for each patient. The muscles of the craniomandibular complex were palpated and assessed for tenderness. Mandibular range of movement was measured by assessing interincisal distance. Palpation and auscultation of the TMJs were also performed. All of the clinical examinations and diagnoses were performed by the same investigator. If all the criteria noted above were fulfilled, a diagnosis of ID was made.

Condylar Path Tracings

Condylar path tracings were recorded and assessed for all control joints and 41 experimental TMJs, by the same investigator, using a SRD (Sam Axiograph, SAM Prazisionstechnik, Munich, Germany). Tracings for maximum opening-closing, protrusive-retrusive, and medial-lateral retrusive excursions of the mandible were recorded. The tracings were analysed according to criteria described by Van Willigen,[9] Harper,[13] and Slavicek[14] to identify ID.

Arthrography

The patients in the experimental group underwent the routine radiologic investigation normally required of patients referred for arthrography of the TMJ. This included a panoramic radiograph, standard radiographs, and TMJ tomographs. Single- or double-contrast arthrotomography of 20 affected TMJs was performed by injection of contrast dye into the inferior and superior joint compartment, under fluoroscopic control. Videotape recordings of the movement of the condyle and disc were made during mandibular function. The control population did not undergo this examination for ethical reasons. Thus, it was not possible to interpret arthrograms in a completely blind manner, and data obtained from this group were, of necessity, compared directly to the other groups.

Magnetic Resonance Imaging

Magnetic resonance imaging was performed on 40 TMJs of the experimental group (affected and nonaffected joints) and on the entire control group (both joints) in the open and closed mandibular position. The imaging procedure was done at the Tri-Hospital Magnetic Resonance Centre located at the Toronto Hospital, and was performed by using the sagittal, T1-weighed, 3-mm continuous slice thickness through the joint, with a spin echo (SE) pulse sequence and a field strength of 1.5 Tesla. In the experimental population, MRI was accomplished immediately before the arthrographic examination to avoid iatrogenic changes that might have occurred if arthrography had been done first.

Data Handling

The clinical, SRD, arthrographic, and MRI examinations were accomplished in isolation and without knowledge of the results of the other three tests. All MRI scans, arthrograms, and condylar path tracings were coded and analyzed in a blind fashion by the investigators. However, by virtue of the fact that arthrograms were being performed, it would be known to the radiologist that a clinical diagnosis of some form of ID had been made. The magnetic resonance images of both the experimental and control groups were interpreted blindly by the radiologist.

The incidence of ID, whether determined clinically, through MRI, or through SRD, in the control TMJs was compared to the incidence of ID in the experimental group for both the clinically affected joints as well as the contralateral nonaffected joints. A comparison of the contralateral nonaffected joints to the affected TMJs in the same individuals was also made to examine the frequency of derangement in the nonaffected joints.

Sensitivity, specificity, and predictive values were assessed for clinical exam, SRD, and MRI with respect to the gold standard of arthrography. Sensitivity of the test measures how well the test detects disease; it is the proportion of those with the disease who give a positive result. Specificity of the test measures how well it detects the absence of disease; it is the proportion of those without the disease who give a negative result. Predictive values are the proportion of those positive who have the disease (positive predictive value [PPV]) and the proportion of those negative who do not have the disease (negative predictive value [NPV]).[15]

Cohen's κ statistic was used to relate the actual measure of agreement obtained with the degree of agreement that would have been attained had the diagnoses been made at random.[16]

The presence of disease implies the diagnosis of disc displacement with reduction (DDR) or disc displacement without reduction (DDWR), whereas the absence of ID implies a diagnosis of normal disc position.

Results

Experimental Group

The independent diagnoses were assessed and compared to the diagnostic results obtained from the gold standard technique—arthrography (Table 1).

There was 85% agreement between the diagnostic findings obtained by clinical examination and

Table 1 Experimental Group — Diagnosis According to Test

Patient	TMJ	Clinical examination	SRD	MRI	Arthrography
LA	R	DDR	DDR	DDR	DDR
	L	Normal	DDR	DDR	–
AA	R	Normal	DDWR	DDR	–
	L	DDWR	DDWR	DDWR	–
SB	R	DDWR	DDWR	DDR	–
	L	Normal	Normal	DDWR	–
LC	L	DDWR	DDR	DDWR	–
RC	R	DDWR	DDWR	Normal	DDWR
	L	Normal	DDWR	Normal	–
SC	R	DDWR	–	–	DDWR
DD	R	DDWR	DDWR	DDR	DDWR
	L	DDWR	DDWR	DDWR	DDWR
DE	L	DDR	DDR	–	DDR
BF	R	Normal	DDWR	DDWR	–
	L	DDWR	DDWR	DDWR	DDWR
CF	R	Normal	–	DDR	–
AF	R	DDWR	DDWR	–	DDWR
AL	R	DDWR	Normal	Normal	–
	L	Normal	Normal	Normal	–
AM	R	Normal	DDR	DDR	–
	L	DDWR	DDWR	DDWR	DDWR
DM	R	Normal	Normal	Normal	Normal
	L	Normal	Normal	Normal	–
KP	R	DDWR	DDWR	DDWR	DDWR
	L	DDR	DDWR	DDWR	–
HP	R	DDWR	–	DDWR	–
	L	DDWR	–	DDWR	DDWR
VP	R	DDWR	DDWR	–	DDWR
KQ	R	Normal	Normal	DDWR	–
	L	DDWR	DDWR	DDWR	DDWR
WR	R	DDWR	DDWR	DDWR	–
	L	Normal	Normal	DDWR	–
NS	R	DDWR	DDWR	Normal	–
	L	Normal	Normal	Normal	–
SS	R	Normal	DDR	DDWR	–
	L	DDWR	DDR	DDWR	–
ShS	L	DDWR	DDWR	–	DDWR
TT	R	DDWR	DDWR	Normal	DDR
	L	Normal	Normal	Normal	–
JT	R	DDWR	DDR	DDWR	DDWR
	L	DDR	Normal	DDWR	–
KW	R	DDR	DDWR	Normal	DDWR
	L	Normal	DDWR	Normal	DDWR
JW	R	DDWR	DDR	Normal	–
	L	Normal	Normal	Normal	–

Diagnostic agreement with arthrography: clinical examination, 85%; SRD, 83%; MRI, 67%. R = right, L = left.

arthrography, while 83% agreement was observed between the diagnosis obtained with the SRD and arthrography. The rate of agreement between MRI and arthrography was only 67%.

Clinical Examination vs Arthrography. The PPV of the clinical examination was 1.0, and the NPV was 0.50. The clinical examination was associated with a diagnostic sensitivity of 0.95, and a specificity of 1.0 ($P = .001$, $\kappa = .64$) (Table 2).

Sagittal Recording Device vs Arthrography. Both the PPV and the NPV from the condylar path tracings were 1.0. Sensitivity for the SRD measurements was 1.0, as was specificity ($P = 0$, $\kappa = 1.0$) (Table 3).

Magnetic Resonance Imaging vs Arthrography. The PPV for MRI diagnosis was 1.0, but the NPV was only 0.20. The MRI results were highly specific, whereas the degree of sensitivity was only 0.71 ($.0918 < P < .0934$, $\kappa = .242$) (Table 4).

Table 2 Clinical Examination vs Arthrography

		Arthrogram		
		+	−	
Clinical examination	+	18	0	18
	−	1	1	2
		19	1	20

+ = DDR or DDWR; − = Normal.

Table 3 Sagittal Recording Device vs Arthrography

		Arthrogram		
		+	−	
SRD	+	17	0	17
	−	0	1	1
		17	1	18

+ = DDR or DDWR; − = Normal.

Table 4 Magnetic Resonance Imaging vs Arthrography

		Arthrogram		
		+	−	
MRI	+	10	0	10
	−	4	1	5
		14	1	15

+ = DDR or DDWR; − = Normal.

Incidence of Bilateral Internal Derangement. The diagnosis of bilateral ID in the symptomatic patients varied with the technique utilized. A clinical diagnosis of bilateral ID was made in only 21% of the symptomatic patients, whereas a higher incidence of joint dysfunction was detected bilaterally with both MRI (63%) and SRD (50%).

Control (Asymptomatic) Group

The findings obtained by clinical examination and SRD were in complete agreement and suggested that all of the control joints were normal. However, in three joints the diagnosis of DDR was made with MRI, and this agreed with clinical and SRD findings 91% of the time (Table 5).

A summary of the percent agreement among the different diagnostic modalities is shown in Table 6. In the symptomatic group of patients, MRI diagnosis agreed with arthrographic diagnosis 67% of the time. There was an overall agreement of 59% between MRI and clinical diagnoses, and the SRD findings agreed with MRI only 51% of the time.

Table 5 Control Group — Diagnosis According to Test

Patient	TMJ	Clinical examination	SRD	MRI
PB	R	Normal	Normal	Normal
	L	Normal	Normal	DDR
RB	R	Normal	Normal	Normal
	L	Normal	Normal	Normal
ME	R	Normal	Normal	Normal
	L	Normal	Normal	Normal
MF	R	Normal	Normal	Normal
	L	Normal	Normal	DDR
KF	R	Normal	Normal	Normal
	L	Normal	Normal	Normal
AI	R	Normal	Normal	Normal
	L	Normal	Normal	DDR
NK	R	Normal	Normal	Normal
	L	Normal	Normal	Normal
GK	R	Normal	Normal	Normal
	L	Normal	Normal	Normal
YM	R	Normal	Normal	Normal
	L	Normal	Normal	Normal
AR	R	Normal	Normal	Normal
	L	Normal	Normal	Normal
MR	R	Normal	Normal	Normal
	L	Normal	Normal	Normal
SS	R	Normal	Normal	Normal
	L	Normal	Normal	Normal
AS	R	Normal	Normal	Normal
	L	Normal	Normal	Normal
LW	R	Normal	Normal	Normal
	L	Normal	Normal	Normal
JW	R	Normal	Normal	Normal
	L	Normal	Normal	Normal
YW	R	Normal	Normal	Normal
	L	Normal	Normal	Normal

Diagnostic agreement with MRI: clinical examination, 91%; SRD, 91%. R = right, L = left.

Table 6 Overall Agreement of Diagnostic Modalities*

	Experimental group		Control group
	Arthrography	MRI	MRI
Clinical examination	17/20 (85%)	20/40 (50%)	29/32 (91%)
SRD	15/18 (83%)	19/37 (51%)	29/32 (91%)
MRI	10/15 (67%)		

*$P = 1.0$ (Fisher's exact 2-tail test).

Discussion

Internal derangement of the TMJ has been defined as an abnormal positional and functional relationship between the disc, the mandibular condyle, and the articulating surfaces of the temporal bone. [3]

Arthrotomography can be used to predict disc position and morphology with a high degree of accuracy, depending on the specific technique employed.[17–23] Although arthrography has been established as the gold standard technique for imaging the soft tissues and the articular disc of the TMJ,[17–19,21,22,24–29] MRI is a noninvasive method for depiction of the meniscus and its attachments in vivo and for detection of disc displacement.[30,31] This technique has become popular for the evaluation of TMJ IDs due to the lack of ionizing radiation, excellent soft tissue visualization, and differentiation of tissue types.[32] Displacements in a direction other than anteroposterior can be demonstrated with MRI, but are difficult to ascertain with other imaging modalities.[33]

The results of our study are not in very strong agreement with those of previous studies.[32,34–36] The reasons for this discrepancy are not clear, but could be related to the fact that, where possible, all tests were interpreted blindly in the present study. In addition, DDR and DDWR were considered here as separate diagnoses and not strictly as ID. This would influence accuracy, in that the identification of ID by one method might be in agreement with a similar arthrographic diagnosis. However, if ID is subdivided into DDR and DDWR, it is possible that even though both diagnoses represent ID, DDR or DDWR might be diagnosed concurrently in the same joint by different methods, thus producing disagreement. Of the 15 TMJs suspected of having ID and examined by arthrography and MRI, there was only 67% agreement between these two tests in assessing disc position. Where there was disagreement between the results of MRI and arthrography, there was a tendency for the former technique to underestimate the severity of derangement (eg, find DDR instead of DDWR) and also to indicate normal disc position when the disc was displaced according to arthrographic criteria. Although MRI did not always detect an arthrographically identified displaced disc, the former technique was accurate to the extent that false-positive diagnoses were not made.

Assessment of 20 TMJs was made by both clinical examination and arthrography, and there was an overall agreement of 85% between the two tests. This produced one of the highest percent agreements of all methods as compared to arthrography, and these findings were in complete agreement with the findings of Donlon and coworkers,[32] who emphasized that a thorough clinical exam, noting history, joint sounds, and mandibular range of motion, was the most accurate correlate to surgical findings. From a clinical standpoint, a diagnosis of ID was correct in every case, and there was no instance where a diagnosis of ID was made when it did not exist. It has been suggested that condylar path tracings generated with a SRD can be used to assess TMJ function, and that this information has diagnostic significance.[11,13,14,37,38] In the study reported here, the findings produced with SRD tracings correlated well with arthrographic results. With respect to identification of the presence of ID, there was complete agreement between condylar path tracings and arthrographic findings. Thus the use of SRD seems to be an accurate method for detecting ID in patients with pain and dysfunction of the TMJ.

Among the contralateral TMJs of symptomatic patients, there was a low level of agreement between findings obtained with MRI and those from the SRD (50%) and the clinical examination (51%). These results are not surprising, given the fact that the MRI demonstrated the lowest degree of agreement with arthrography, while the two former techniques showed similarly high correlations with arthrographic findings.

Many of the situations in which a lack of agreement between the results of MRI and clinical examination or SRD appeared were due to a lower degree of severity in diagnosis with MRI compared to the other two techniques, eg, joints diagnosed as normal with MRI vs a diagnosis of DDR with clinical examination and SRD.

Control (Asymptomatic) Group

A diagnosis of normal was made for 32 TMJs by use of both clinical examination and the SRD. However, examination of the control group by MRI detected the presence of ID in three of the apparently normal TMJs. By extrapolating our statistical findings (predictive values, sensitivity, specificity) from the experimental group to this group, it might be concluded that if MRI missed arthrographically demonstrated ID 33% of the time, then the incidence of ID in the control group might be even higher than 9%. Indeed, a higher incidence of ID in the control group subjects would be in agreement with those of previous studies where joints have been assessed by either MRI or arthrography.[29,39,40]

This difference may exist because even in totally asymptomatic TMJs, a disc may be displaced (as

shown by MRI or arthrography) in the absence of changes in joint translation. Since the SRD and clinical examination rely on assessment of TMJ translation, these measurements can only identify whether a joint is translating within normal limits. However, the results indicate that a joint can translate normally even with a displaced disc.

Incidence of Bilateral Internal Derangement

Frequently, arthrographic investigations are only performed on the joint considered to be affected by dysfunction, not the contralateral one. However, the jaw acts as a single unit with the TMJs connected by the mandible, which functions as a yokelike structure.[4] Bilaterally affected joints are reported in up to 50% of patients with TMJ by means of MRI, indicating the need to assess both joints.[33] In a study using computed tomography (CT) to diagnose ID, it was estimated that up to 25% of the patients had bilaterally affected joints.[41] An arthrographic study in adults demonstrated bilateral ID in 50% of the patients.[42]

Previous studies utilizing CT scans and arthrography used small patient populations due to the limitations of these techniques. With the use of MRI, bilateral ID has been demonstrated in 79% of patients in a study of 96 joints.[43] Sanchez-Woodworth and coworkers[4] obtained similar results by using MRI to examine both TMJs in each patient with signs and symptoms of TMJ ID.

The findings from our investigation suggest that bilateral involvement of the TMJ may be detected in a significant number of patients with pain and dysfunction of the TMJ. The incidence was found to vary according to the diagnostic test utilized. The clinical examination revealed a 21% incidence of bilateral ID in the experimental group, while a higher incidence of bilateral involvement was recorded with SRD (50%) and with MRI (63%). The results obtained with the two latter techniques are in agreement with those quoted in previous investigations,[4,33,42,43] whereas the findings from our clinical examination are similar to the results of Helms and coworkers,[41] who based their results on arthrography. Based on the accuracy of MRI in detecting ID when it is known to be present (according to arthrography), it seems likely that the patients in whom ID was detected bilaterally were correctly diagnosed. Thus, it is suggested that the incidence of bilateral ID in the symptomatic patients (experimental group) may be in the range of 50% to 60%.

The reasons for an elevated incidence of involvement of both TMJs in the symptomatic group—in our study as well as in previous reports—is unknown. It may be hypothesized that patients who have had a prior history of injury or trauma to the head, neck, or jaws may have sustained either direct or indirect damage to the TMJ. Therefore, any exogenous factor that may precipitate the development of ID in one TMJ might lead to the development of ID in the contralateral joint. While symptoms may be present in both joints, the individual may experience pain and dysfunction of greater intensity and severity in only one of the joints before experiencing symptoms on the other side.

Conclusion

The results of this study reveal and compare the strengths and weaknesses of the different diagnostic modalities. Arthrography, MRI, SRD tracings, and clinical examination provide complementary information about joint function. Since it was not possible to correlate the results from clinical exam, SRD, MRI, and arthrography with surgical findings in this study, there exists a degree of error inherent in each test, despite the level of accuracy achieved with each method of investigation used. Thus, in some instances it may be necessary to use a combination of techniques for assessment of ID in the TMJ. However, it is significant that MRI does not appear to provide information as reliably as the other methods of assessment. Thus, clinical examination may be all that is required in most cases to confirm or rule out significant disc derangement. The use of SRD methods does not appear to confer any diagnostic advantage in routine clinical use. Nonetheless, SRD recordings will likely provide excellent data for use in clinical research studies.

In addition to the above-noted implications, it would also seem clear that although ID can be identified by a number of technological methods, history and clinical examination remain highly reliable. Moreover, in view of the fact that some patients with unilaterally symptomatic joints demonstrated bilateral disc displacement, and since ID was also identified in asymptomatic patients, it would appear that the mere identification of ID, in the absence of historical and clinical data, cannot constitute a diagnosis of disease or dysfunction in and of itself.

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Resumen

Evaluación del Malfuncionamiento Interno de la Articulación Temporomandibular

La incidencia del malfuncionamiento interno de la articulación temporomandibular (ATM) ha sido documentada en pacientes que sufren de desórdenes temporomandibulares. Sin embargo, la detección y el diagnóstico del desplazamiento de un disco de la ATM en relación al malfuncionamiento interno no son precisos siempre, y varían de acuerdo al método de examen. Se realizó un examen clínico, prospectivo en 26 pacientes (45 ATM) que tenían signos y síntomas de dolor articular y disfunción; para determinar la exactitud del examen clínico, del instrumento para trazado de registros sagitales e imágenes de resonancia magnética y artrográfica, en la detección del malfuncionamiento interno de la ATM. Se examinaron 16 pacientes (controles) asintomáticos (32 ATM), para determinar la presencia de malfuncionamientos internos por medio de los métodos mencionados anteriormente. También se estimó la incidencia del malfuncionamiento interno bilateral en las ATM de los pacientes sintomáticos. Los hallazgos obtenidos por medio del examen clínico y de los trazados de los registros sagitales coincidieron mas frecuentemente con los hallazgos artrográficos de malfuncionamiento interno. La resonancia magnética fue incapaz de detectar muchas veces, el malfuncionamiento interno detectado por los exámenes artrográficos. Se identificaron malfuncionamientos internos bilaterales en un número significativo de pacientes afectados por tal desorden, a pesar de la ausencia de síntomas bilaterales. La incidencia varió de acuerdo a la técnica utilizada. En el grupo de control el examen clínico y los registros sagitales determinaron que el 9% de las ATM eran normales, sin embargo el examen a base de imágenes de resonancia magnética determinó que estas articulaciones sufrían de malfuncionamiento interno.

Zusammenfassung

Abklärung des "internal derangement" des Kiefergelenkes

Die Inzidenz des "internal derangement" des Kiefergelenkes bei Patienten mit Myoarthropatien des Kausystems wurde dokumentiert. Die Diagnose einer Verlagerung des Diskus im Falle eines "internal derangement" ist nicht immer genau und variiert oft mit der gewählten Untersuchungsmethode. In einer prospektiven klinischen Studie wurden 26 Patienten (45 Kiefergelenke) mit Symptomen einer Myoarthropathie des Kausystems (MAP) klinisch, ferner mit Hilfe des SAM-Axiographs (SAM), mittels Arthrographie und Kernspintomographie (MRI) geprüft auf Vorliegen eines "internal derangement" der Kiefergelenke. Eine Kontrollgruppe von 16 asymptomatischen Individuen (32 Kiefergelenke) wurde klinisch, mit MRI und SAM untersucht. Ausserdem wurde bei der MAP-Gruppe die Inzidenz einer beidseitigen Diskusverlagerung ermittelt. Die Resultate der klinischen Untersuchung stimmten weitgehend mit denjenigen der SAM-Registrierung und der Arthrographie überein. Auf den MRI-Bildern konnte eine arthrographisch festgestellte Diskusverlagerung häufig nicht gefunden werden. Trotz Fehlen einer beidseitigen Symptomatik konnte bei einer signifikanten Anzahl von Patienten eine beidseitige Diskusverlagerung gefunden werden. Allerdings wurden mit unterschiedlicher Untersuchungstechnik unterschiedliche Resultate erreicht (21% klinisch, 50% SAM, 63% MRI). Neun Prozent der Kiefergelenke aus der Kontrollgruppe, die klinisch und mit der SAM-Registrierung als normal eingestuft worden waren, zeigten im MRI eine Diskusverlagerung. Die Diagnose einer Diskusverlagerung sollte also nicht auf einer einzigen Untersuchungsmethode basieren, sondern wenn möglich auf mehreren, die sich gegenseitig erwiesenermassen ergänzen. Von zentraler Bedeutung für die Diagnose eines "internal derangement" bleiben aber nach wie vor die Anamnese und eine gründliche klinische Untersuchung.