Radiology

ORIGINAL RESEARCH • MUSCULOSKELETAL IMAGING

Diagnostic Benefit of MRI for Exclusion of Ligamentous Injury in Patients with Lateral Atlantodental Interval Asymmetry at Initial Trauma CT

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Background: Cervical spine CT is regularly performed to exclude cervical spine injury during the initial evaluation of trauma patients. Patients with asymmetry of the lateral atlantodental interval (LADI) often undergo subsequent MRI to rule out ligamentous injuries. The clinical relevance of an asymmetric LADI and the benefit of additional MRI remain unclear.

Purpose: To evaluate the diagnostic benefit of additional MRI in patients with blunt trauma who have asymmetry of the LADI and no other cervical injuries.

Materials and Methods: Patients who underwent cervical spine CT during initial trauma evaluation between March 2017 and August 2019 were retrospectively evaluated. Those who underwent subsequent MRI because of LADI asymmetry of 1 mm or greater with no other signs of cervical injury were identified and reevaluated by two readers blinded to clinical data and initial study reports regarding possible ligamentous injuries.

Results: Among 1553 patients, 146 (9%) had LADI asymmetry of 1 mm or greater. Of these, 46 patients (mean age ± standard deviation, 39 years ± 22; 28 men; median LADI asymmetry, 2.4 mm [interquartile range, 1.8–3.1 mm]) underwent supplementary MRI with no other signs of cervical injury at initial CT. Ten of the 46 patients (22%) showed cervical tenderness at clinical examination, and 36 patients (78%) were asymptomatic. In two of the 46 patients (4%), MRI revealed alar ligament injury; both of these patients showed LADI asymmetry greater than 3 mm, along with cervical tenderness at clinical examination, and underwent treatment for ligamentous injury. In 13 of the 46 patients (28%), signal intensity alterations of alar ligaments without signs of rupture were observed. Four of these 13 patients (31%) were subsequently treated for ligamentous injury despite being asymptomatic.

Conclusion: Subsequent MRI following CT of the cervical spine in trauma patients with lateral atlantodental interval asymmetry may have diagnostic benefit only in symptomatic patients. In asymptomatic patients without proven cervical injuries, subsequent MRI showed no diagnostic benefit and may even lead to overtreatment.

Online supplemental material is available for this article.

Up to 2%–6% of patients show acute cervical spine injuries (CSIs) after blunt trauma (1,2). Most CSIs are reported to be fractures; ligamentous injuries and combined injuries are far less common (2), and spinal cord injuries occur rarely (0.07%–0.26%) (3). However, if such lesions are missed during the initial clinical examination, serious neurologic deficits and cervical spine instability may arise. Previous studies have shown that about half of all CSIs are not suspected at clinical examination. Thus, criteria suggesting CSIs have been established as a decision aid for the use of further radiologic evaluation (eg, the National Emergency X-Radiography Utilization Study Group, or NEXUS, criteria and the Canadian C-Spine Rule) (4). On the basis of those criteria, guidelines such as the American College of Radiology Appropriateness Criteria (5) and the Eastern Association for the Surgery of Trauma Practice Management Guidelines (6) recommend further radiologic evaluation following adequate cervical trauma. CT has replaced conventional radiography as the modality of choice because of its superiority in the detection of skeletal injuries (7). Hence, CT is frequently used for initial evaluation of trauma patients in the emergency department because it is fast and accurate, has widespread availability, and is cost-effective (8).

The exclusion of ligamentous injury at cervical spine CT (CSCT) may cause diagnostic difficulties. Although an increased anterior atlantodental interval (AADI) is accepted as a sign of underlying pathologic abnormality (9), the clinical relevance of an asymmetric lateral atlantodental interval (LADI) remains unclear. Besides ligamentous injury or atlantoaxial rotational fixation and/or subluxation at the C1/C2 level (10,11), anatomic variations, head

Abbreviations

AADI = anterior atlantodental interval, CSCT = cervical spine CT, CSI = cervical spine injury, IQR = interquartile range, LADI = lateral atlantodental interval

Summary

Additional MRI for exclusion of ligamentous injuries in trauma patients with lateral atlantodental interval asymmetry provides diagnostic benefit in symptomatic patients only and may contribute to overtreatment in asymptomatic patients.

Key Results

- In a retrospective study of 1553 trauma patients, 146 (9%) showed lateral atlantodental interval (LADI) asymmetry of 1 mm or greater, with no correlation to head rotation or lateral head tilt.
- Two of 46 patients (4%) with LADI asymmetry and lack of proven cervical injury at CT showed alar ligament injury at MRI and were symptomatic.
- Normal-variant signal intensity alterations of the alar ligaments were misinterpreted as ligamentous injury in asymptomatic patients, resulting in unnecessary treatment.

rotation, and muscle spasm may also affect LADI. Hence, LADI asymmetry may also be observed in healthy individuals as a normal variant (12,13). Trauma patients with LADI asymmetry at radiography or CT are frequently admitted for subsequent MRI to rule out CSI. This leads to a tremendous amount of MRI examinations that occupy MRI resources and may also increase treatment costs. Previous studies have shown ambiguous results concerning the benefit of additional MRI after negative findings at CSCT (14–18).

The purpose of this study was to assess the additional diagnostic value of cervical spine MRI in trauma patients with detected LADI asymmetry as the only abnormality at preceding CSCT.

Materials and Methods

The study was approved by the institutional review board, and the need for written informed consent was waived because of the retrospective study design.

Patient Selection

We evaluated patients who presented to the emergency department of the University Hospital Bonn, Germany, who underwent CSCT after being involved in blunt trauma between March 2017 and August 2019. Inclusion criteria were *(a)* proof of an LADI asymmetry of 1 mm or more at the preceding CSCT examination without any other radiologic signs of CSI and *(b)* subsequent MRI due to LADI asymmetry. Exclusion criteria were *(a)* no LADI asymmetry at CSCT, *(b)* pathologic findings at CSCT, *(c)* previous cervical surgery, or *(d)* no additional MRI performed. Patient characteristics were retrieved by using the institutional clinical information system.

Image Acquisition

All CT scans were obtained in the emergency department of our hospital by using a 128-section CT scanner (Somatom Definition Edge with Sliding Gantry; Siemens Healthcare). Noncontrast CT scans were obtained with a collimation of 128 × 0.6 mm and a pitch of 0.8. Reformatted images were reconstructed with a section thickness of 1 mm in coronal, transverse, and sagittal planes. X-CARE (Siemens Healthcare) was used as the tube current modulation technique.

Noncontrast MRI examinations were performed with either a 1.5-T or 3.0-T whole-body MRI system (Ingenia; Philips Healthcare). In addition to a sagittal T1-weighted turbo spin-echo sequence, T2-weighted mDIXON turbo spin-echo sequences in coronal, sagittal, and axial planes were performed. Typical imaging parameters are given in Tables E1 and E2 (online).

Image Analysis

CT and MRI scans of included patients were reevaluated by two independent board-certified readers (J.A.L. and P.A.K., with 8 and 9 years of experience, respectively, in CT and MRI trauma imaging) with regard to ligamentous injuries and any other radiologic signs of CSI. In case of discrepancy, a consensus reading was held. The results of the expert reading were considered the reference standard against which the results of the initial report were compared. All measurements were performed by the same radiologist (C.H.E., with 4 years of experience in CT and MRI trauma imaging). All readers were blinded to clinical data and initial study reports but not to the indication for MRI.

Image analysis was performed at a dedicated workstation (IMPAX EE; AGFA Healthcare). For the CT scans, axial, coronal, and sagittal reformations were reconstructed to allow maximal symmetry. AADI, LADI, head rotation, lateral head tilt, and lateral translation of the lateral margins of C1 on C2 were calculated.

For determining the AADI, sagittal reconstructions were used, measuring in midsagittal planes. Each individual left and right LADI and the offset of the lateral margins of C1 on C2 were measured in the coronal plane (see Fig E1 [online] for exemplary measurements).

LADI asymmetry was calculated by subtracting the value of the left interspace from the right interspace. The values were noted in absolute and real numbers to determine the magnitude and directionality of the asymmetry.

The lateral head tilt was measured in coronal CT reconstructions. For C0 lateral tilt, a line between the most caudal points of the occipital condyles was drawn and the angle to a reference line parallel to the CT table calculated. C2 lateral tilt was measured by determining the angle between the horizontal center line of axis vertebrae and the reference line parallel to the CT table. The differences of the respective angles were calculated.

Rotational angles of the occiput and of the atlas and axis vertebrae were measured in axial reconstructions in correlation to a vertical reference line (perpendicular to the CT table), and the differences of angles between C0, C1, and C2 were calculated.

Statistical Analysis

Statistical analysis was performed by one author (J.A.L.) using Prism software (version 8.4.2,; GraphPad Software). Normal distribution was checked by using the Shapiro-Wilk test. Continuous variables were summarized with medians and interquartile ranges (IQRs) or ranges or with means ± standard deviations,

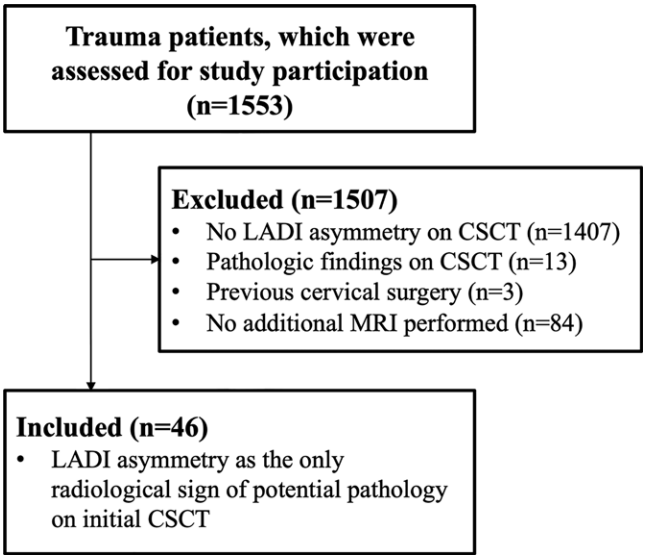

Figure 1: Flowchart shows trauma patients included in study. CSCT = cervical spine CT, LADI = lateral atlantodental interval.

as appropriate. Continuous variables were compared by using the Mann-Whitney *U* test or Student *t* test, as appropriate. Dichotomous variables were summarized with counts and percentages and were compared between respective groups by using the χ^2 test. Correlation was tested with the Spearman correlation coefficient. Interrater agreement of the two musculoskeletal expert readers was determined by using the Cohen κ coefficient. $P < .05$ was considered to represent a statistically significant difference.

Results

Patient Characteristics

A total of 1553 trauma patients underwent CSCT in the emergency department of our hospital between March 2017 and October 2019. Among these, 1407 patients were excluded for lack of LADI asymmetry of 1 mm or greater, leaving 146 of the 1553 patients (9%) in the study sample. Among those 146 patients, 62 (43%) underwent supplementary MRI of the cervical spine to exclude CSI. Among those, another 16 patients had to be excluded because there were pathologic findings on the initial CT scan ($n = 13$) or the patient had previously undergone cervical surgery ($n = 3$). Thus, 46 of the 62 patients (74%) with asymmetry of the LADI as the only radiologic sign of potential pathologic abnormality at CT were included (Fig 1). The median time between CT and MRI was 1 day (IQR, 1–3.3 days). Twenty-eight of the 46 patients (61%) underwent 1.5-T imaging and 18 (39%) underwent 3.0-T imaging ($P = .06$). The mean patient age was 39 years ± 22 (standard deviation); 28 patients were men (mean age, 42 years ± 23) and 18 were women (mean age, 32 years ± 20) ($P = .14$). Forty-two of the 46 patients (91%) presented to the emergency department with a pre–clinically applied hard collar. The primary indication for MRI in these patients was exclusion of ligamentous injuries due to an asymmetry of the LADI at trauma CT. A more detailed overview of the patient characteristics and indications is given in Table 1.

Table 1: Patient Characteristics, Mechanism of Injury, and Posttraumatic Diagnoses

Variable	Value
Patient characteristics	
Sex	
Female	18 (39)
Male	28 (61)
Age (y)*	39 ± 22
Injury severity score†	5 (1–10)
Abbreviated injury score†	1 (1–1)
Cervical tenderness at initial evaluation	10 (22)
Mechanism of injury	
Road accident	26 (57)
High-speed motor vehicle collision	13 (28)
High-speed motorcycle collision	3 (7)
Bicycle collision	8 (17)
Pedestrian struck	2 (4)
Fall from height >2 m or fall down more than five stairs	9 (20)
Fall from standing with direct trauma to head	8 (17)
Horse riding accident	3 (7)
Posttraumatic diagnoses detected at MRI	
Exclusion of cervical spine injuries	40 (87)
Alar ligament injuries	2 (4)
Ligament injuries at other levels	1 (2)
Bone bruise	2 (4)
Prevertebral hematoma	1 (2)
Signal intensity alterations in alar ligaments without rupture	13 (28)

Note.—Except where indicated, data are numbers of patients ($n = 46$), with percentages in parentheses.

* Data are means ± standard deviations.

† Data are medians, with interquartile range in parentheses.

Clinical Examination

Ten of the 46 patients (22%) presented with cervical tenderness on palpation at initial clinical examination (first and/or second survey). Two symptomatic patients had ligamentous injury of the alar ligaments with influence on the treatment regimen. One symptomatic patient had a prevertebral hematoma and another had an interspinous ligament strain; this had no influence on the treatment regimen of either patient. Six symptomatic patients did not show CSI at MRI. Thirty-six of the 46 patients (78%) did not show any clinical symptoms at initial clinical examination.

CT Results

The median AADI was 1.3 mm (IQR, 1.0–1.5 mm). The median right-sided LADI was 3.7 mm (IQR, 2.8–5.1 mm), and the median left-sided LADI was 4.2 mm (IQR, 2.7–5.8 mm). The median LADI asymmetry was 2.4 mm (IQR, 1.8–3.1 mm); asymmetry was right-sided in 27 of the 46 patients (59%) (see Tables 2 and 3 for detailed magnitudes of LADI asymmetry). The median head rotation was 2.3° (IQR, 1.4°–5.1°), mostly with

Table 2: Measurements of Cervical Spine CT in 46 Patients

Variable	Median	IQR	Range
AADI (mm)	1.3	1.0–1.5	0.5–3.2
LADI left (mm)	4.2	2.7–5.8	1.4–9.8
LADI right (mm)	3.7	2.8–5.1	2.1–8.6
LADI asymmetry (mm)	2.4	1.8–3.1	1–7.1
Lateral mass translation C1/C2 left (mm)	2.7	2.4–2.9	1–3.8
Lateral mass translation C1/C2 right (mm)	2.7	2.4–3.0	1.3–3.9
Head rotation (degrees)	2.3	1.4–5.1	0.0–17.1
Lateral tilt (degrees)	1.8	0.6–3.3	0.1–9.5

Note.—AADI = anterior atlantodental interval, IQR = interquartile range, LADI = lateral atlantodental interval.

Table 3: Magnitude with Frequencies of LADI Asymmetry in 46 Patients

LADI Asymmetry	No. of Patients (n = 46)
1–2 mm	15 (33)
>2–3 mm	18 (39)
>3 mm	13 (28)

Note.—Data are numbers of patients, with percentages in parentheses. LADI = lateral atlantodental interval.

rotation toward the right side (24 of 46 patients [52%]). The median lateral tilt was 1.8° (IQR, 0.6°–3.3°). No correlation was observed between LADI asymmetry and head rotation (r = −0.13,; P = .38) or lateral head tilt (r = 0.07; P = .66) (Fig 2). The lateral margins of C1 on C2 showed a median lateral translation of 2.7 mm (IQR, 2.4–3.0 mm) on the right side and 2.7 mm (IQR, 2.4–2.9 mm) on the left side. No patients showed a loss of C1/C2 facet overlap less than 20% as an indicator of rotatory subluxation.

MRI Results

Six of the 46 patients with LADI asymmetry and lack of cervical injuries at initial CSCT (13%) showed CSI at MRI (Table 1). Ligamentous injuries of the cervical spine at the C1/C2 level were verified in two of the 46 patients (4%); one patient had a complete rupture of the right alar ligament (LADI asymmetry, 5.1 mm; Fig 3), and the other had a partial rupture of the right alar ligament (LADI asymmetry, 3.4 mm; Fig 4). The diagnoses influenced the therapeutic regimen in both patients: surgical fixation of the C1/C2 joint was needed for the first patient, and a 6-week extension of cervical collar treatment was needed for the other patient. Apart from those ligamentous injuries, an interspinous ligament strain at the C6/C7 level (n = 1, symptomatic patient), mild bone bruises (n = 2, both patients asymptomatic), and a prevertebral hematoma (n = 1, symptomatic patient) were diagnosed in the remaining four patients with CSI. These findings did not necessitate any treatment. Signal intensity alterations of the alar ligaments without ruptures or with partial ruptures were observed in 13 of the 46 patients (28%) (Fig 5). In four of the 46 patients (9%), signal intensity alterations were considered as ligamentous injuries at the initial clinical reading but not at consensus review by the two expert readers. This initial evaluation led to an adjustment of treatment regimen by extending the use of a cervical collar for 6 weeks. These patients were asymptomatic. The κ coefficient of the two expert readers regarding the evaluation of spine MRI before consensus reading was good (κ = 0.79; 95% CI: 0.39, 1.0).

Discussion

Until now, studies investigating the utility of MRI in the detection of cervical spine injuries after a negative CT scan have shown ambiguous results (14–18). Trauma society guidelines recommend cervical collar removal after a negative CT scan alone, even in adults with obtunded blunt trauma (19). Because lateral atlantodental interval asymmetry in trauma patients can be caused by normal variants, ligamentous injuries, and incorrect positioning, such a finding may lead to diagnostic difficulties at cervical spine CT.

Our study aimed to clarify whether trauma patients with LADI asymmetry and lack of cervical injuries at initial CT benefit from complementary MRI. We found an LADI asymmetry of 1 mm or greater in 146 of 1553 trauma patients (9%), with no correlation to head rotation (r = −0.13; P = .38) or lateral head tilt (r = 0.07; P = .66). Six of the 46 patients (13%) with supplementary MRI had CSI; however, only two of these patients (4%) had unilateral alar ligament injuries that resulted in a therapeutic consequence. Both patients were symptomatic, which already clinically suggested a ligamentous injury. No other patients had ligamentous injuries, even if larger LADI asymmetry (up to 7.1 mm) was present. Most patients (36 of 46 [78%]) were asymptomatic at the cervical level. Thirteen of the 46 patients (28%) showed at least one-sided signal intensity alterations of the alar ligaments without ruptures as a normal variant; only two patients were symptomatic. These signal intensity alterations were initially misinterpreted as ligamentous injury in four of the 46 patients (9%), all of them asymptomatic, and led to unnecessary treatment.

Following Billmann et al (13), we used a threshold value of 1.0 mm for LADI asymmetry. The incidence was lower in our posttraumatic study sample (9%) than in a different posttraumatic sample (29%) (13) and a healthy Chinese sample (31%) (20).

Unilateral alar ligament injuries seem to be rare, which aligns with our study findings (two patients [4%]). Although a biomechanical study even argues against an involvement of alar ligaments in whiplash injuries (21), Unal et al (22) suspected these injuries to be more common than diagnosed in a recent small study with only six patients.

Neck pain aggravated with rotation and dens lateralization at CT are the most significant findings for alar ligament injuries during clinical and radiologic examination (22). The discrepancy between clinical symptoms and morphologic diagnosis is a challenge in evaluating trauma patients: Patients

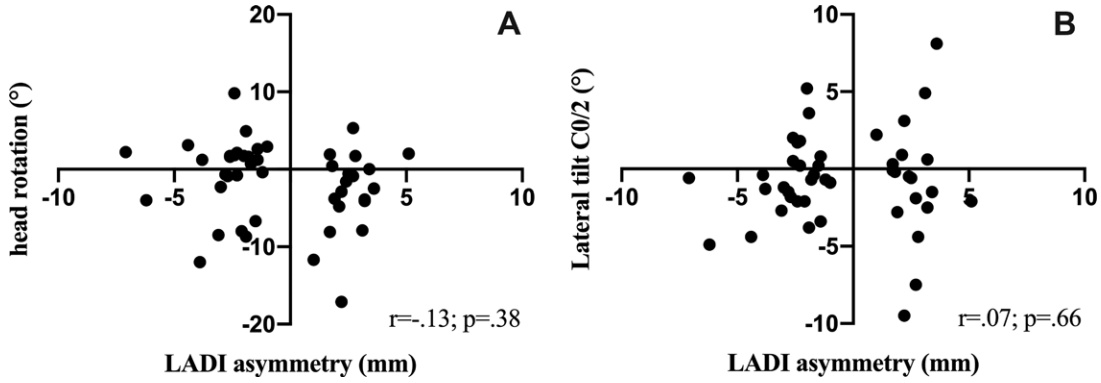

Figure 2: Scatterplots show no correlation between **(A)** lateral atlantodental interval (LADI) and head rotation and **(B)** LADI and lateral head tilt. Spearman correlation coefficients are provided.

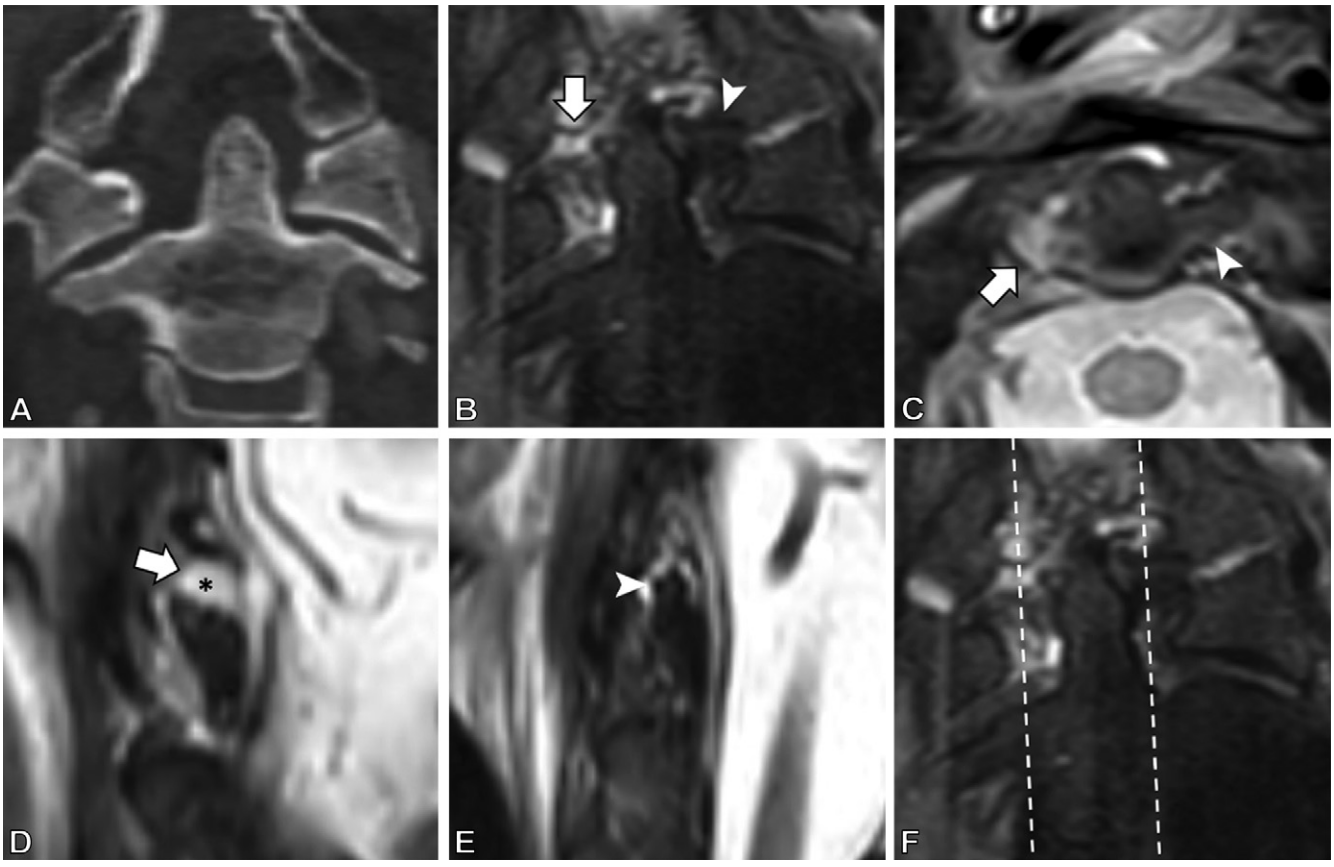

Figure 3: **(A)** Coronal noncontrast CT reconstruction in a 57-year-old man with complete rupture of the right alar ligament with lateral atlantodental interval asymmetry. **(B–D)** Coronal **(B)**, transverse **(C)**, and sagittal **(D)** noncontrast T2-weighted mDIXON turbo spin-echo MRI scans show rupture. Arrow indicates the ruptured right alar ligament; arrowhead in **B** and **C** shows the intact left alar ligament. Note the missing right alar ligament on sagittal plane (∗ in **D**). **(E)** Sagittal noncontrast T2-weighted mDIXON turbo spin-echo MRI scan on left side clearly shows the ligament (arrowhead). **(F)** Same image as in **B**. Dashed lines show position of the sagittal planes.

with severe clinical symptoms may not show any cervical injuries (23,24). In addition, healthy individuals serving as control participants show signal intensity alterations and anatomic variations of alar ligaments (25–27). Chen et al (28) underlined the difficulty of differentiating between signal intensity changes due to physiologic evolution and chronic physical damage in older patients. Because it is impossible to differentiate between injuries and normal variants, Muhle et al (29) proposed that ligament injuries should be diagnosed only if tears or avulsion fractures are visible. Vetti et al (25) even concluded that additional posttraumatic cervical MRI should not be recommended because of a lack of clinical consequence. Small amounts of fluid are evident in 8% of the joints of the craniocervical junction and in 56% in the C1/C2 joints; thus, they should not be overinterpreted regarding potential CSI (30). Review of these studies illustrates that even in the acute trauma setting, differentiation between traumatic and nontraumatic ligament signal intensity changes is nearly impossible, especially if secondary signs of injury, such as hemorrhage, are missing. Therefore, we did not interpret sole

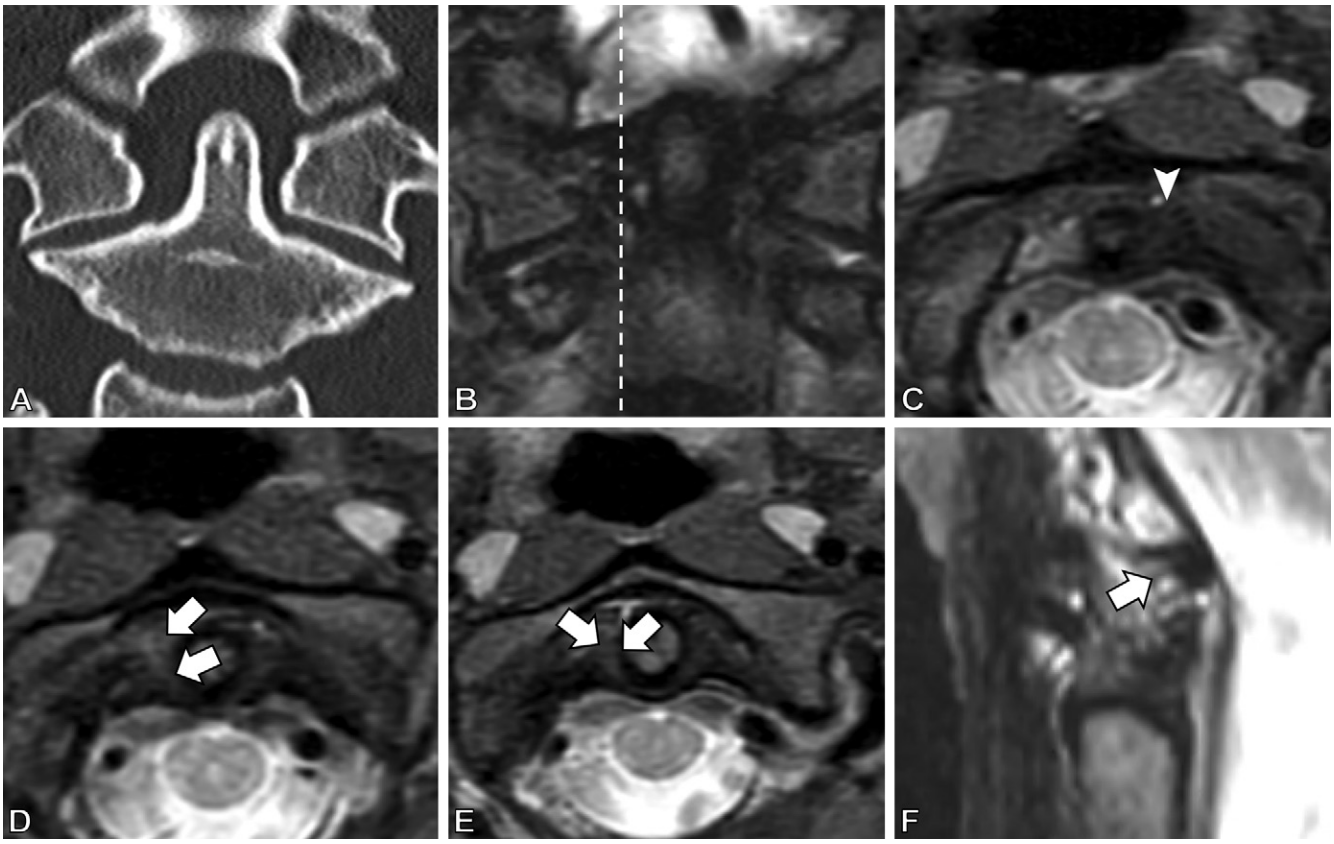

Figure 4: **(A)** Coronal noncontrast CT reconstruction in a19-year-old man with partial rupture of the right alar ligament adjacent to the dens axis with lateral atlantodental interval asymmetry. **(B–F)** The partial alar ligament rupture can not only be seen on coronal **(B)** and transverse **(C–E)** noncontrast T2-weighted mDIXON turbo spin-echo MRI scans but also on the sagittal image (also a noncontrast T2-weighted mDIXON turbo spin-echo scan) **(F)** in the ventral parts of the ligament. Arrows in **D–F** indicate the partially ruptured ligament; arrowhead in **C** shows the intact left alar ligament. Dashed line in **B** shows the position of the sagittal plane.

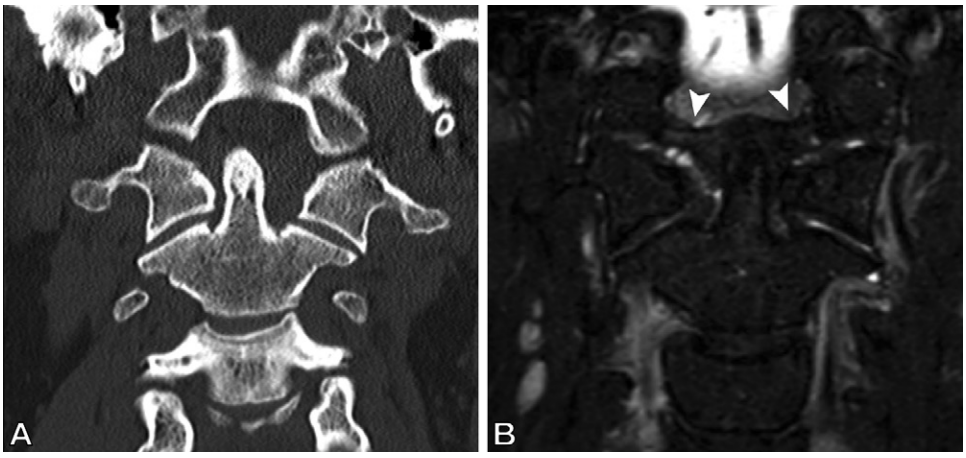

Figure 5: **(A)** Coronal noncontrast CT reconstruction in an asymptomatic 49-year-old man after motorbike accident shows lateral atlantodental interval asymmetry toward the right side. **(B)** Noncontrast coronal T2-weighted mDIXON turbo spin-echo MRI scan shows intact alar ligaments (arrowheads) with slight signal intensity alterations.

ligament signal intensity alterations or adjacent asymmetric fluid collections as injuries. In that aspect, our results differ from those of other studies with a higher incidence of detected CSI at MRI. In a recent study, 92.6% of 149 "positive MRI" results were classified as "stable injuries" and consisted mainly of ligament signal intensity changes (14).

Several investigators have postulated that head rotation (13,31) and even lateral head tilt (32) result in LADI asymmetry. We found no correlation of LADI asymmetry to either of these, supporting the theory that LADI asymmetries are mostly normal variants regardless of head positioning. Nevertheless, the missing correlation between LADI asymmetry and head rotation could also be explained by the low individual head rotation (median rotation, 2.3°) in our study sample, perhaps due to the emphasis on correct head positioning in our institution.

The patient with complete rupture of the right alar ligament underwent surgery because of atlantoaxial instability, whereas the patient with partial rupture of the right alar ligament received conservative treatment with a cervical collar for 6 weeks. Four of 13 (31%) asymptomatic patients with signal intensity alterations of alar ligaments received conservative treatment with a cervical collar for 6 weeks. These treatments followed initial radiologic misinterpretation of the ligamental signal intensity alterations as injuries. Because these signal intensity alterations—according

to the above-mentioned studies—should primarily not be interpreted as injuries, overtreatments have probably taken place. The use of cervical collars carries the rare risk of complications, such as pressure ulcers (19). Thus, overtreatment should be avoided. Early mobilization of the cervical spine may even be considered beneficial in stable injuries compared with continued immobilization (33,34).

The reliability and benefits of MRI in excluding alar ligament injuries are disputable. With use of intraoperative correlation, Dyas et al (35) revealed that MRI is imperfect in depicting upper cervical ligament injuries in patients with atlanto-occipital dissociation due to inconsistent and unsatisfactory inter- and intraobserver reliability. They concluded that standardized algorithms are needed for the use of MRI and interpretation of MRI findings. Moreover, additional MRI might increase the number of low-value diagnoses, risks unnecessary treatment plans, puts patients with multiple injuries at risk by necessitating a move to the MRI suite, and, at best, results in the same clinical action of collar removal (19). Some authors conclude that additional MRI after CSCT may have utility only in certain patients with persistent abnormal findings at neurologic examination (14–16,18). Our results also indicate that MRI may be beneficial only in symptomatic patients with LADI asymmetry.

Our study had limitations. Because of the retrospective design, we could not determine why some patients with LADI asymmetry and persisting symptoms were not admitted for subsequent MRI. Most patients in our study sample (36 of 46 [78%]) were asymptomatic at the cervical spine, lowering the probability for CSI. However, by strictly applying the National Emergency X-Radiography Utilization Study Group criteria and/or the Canadian C-Spine Rule, all of these patients required further CSCT, mostly because of intense trauma mechanism or other "distracting injuries" independent of the cervical spine. Moreover, the final number of patients included in our study is low. At the same time, the ratio between "true-positive" and "false-positive" cases is very low. This is most likely related to the particular scenario evaluated; mere ligamentous injuries of the upper cervical joints without concomitant fractures in general are rare. In addition, according to the Injury Severity Score and Abbreviated Injury Scale, our study sample consisted of only a few patients with serious injuries.

In conclusion, our results indicate that additional MRI for exclusion of ligamentous injuries in trauma patients with lateral atlantodental interval asymmetry may be considered reasonable only in symptomatic patients. The additional diagnostic value in clinically asymptomatic patients without proven cervical injuries seems low and may contribute to overtreatment. Larger study samples and prospective study designs are needed to eventually verify our results.

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