



ORTHO NEWSCAST



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Dear Doctor,
Greetings from Micro Labs. We are happy to bring you "Ortho Newscast" which contains latest and interesting news in the field of Orthopaedics.

This issue contains

- **Age Leads COVID-19 Hospitalization Risk Factors in RMDs**
- **Successful conservative treatment of a soccer player with multiple-level spondylolysis: A Case report**
- **In The NEWS: The Artificial Intelligence System accuracy in determining the Radiographic Stage of Knee Osteoarthritis**

Should you require any specific article or medical information, please feel free to contact us at medicalservices@microlabs.in

Looking forward to your valuable feedback

Best Regards,
Medical Team,
Micro Labs Limited



Age Leads COVID-19 Hospitalization Risk Factors in RMDs

Aged 65 years and older is associated with the highest risk of people with rheumatic and musculoskeletal diseases (RMDs) needing hospital treatment for COVID-19, according to the first results to be reported from ReCoVery, the German national COVID-19 registry.

Older patients with RMDs were five times more likely than younger patients to be hospitalized if they tested positive for SARS CoV 2 and developed COVID-19 (odds ratio, 5.1; 95% confidence interval, 2.3-11.4). The likelihood of hospitalization was also significantly increased by the current or prior use of glucocorticoids (OR, 2.59; 95% CI, 1.2-5.4) and by the presence of cardiovascular disease (OR, 2.27; 95% CI, 1.2-5.4). The register is a joint initiative of the German Society for Rheumatology and the Justus Liebig University in Giessen. The risk of SARS-CoV-2 infection in patients with inflammatory rheumatic diseases [IRD] is still largely unknown. It is still not known whether they have a high risk of getting the infection or whether they have a higher risk of a severer case, therefore there's an urgent need to have data to generate evidence for the management of patients as per the authors.



Launched at the end of March 2020, the German registry now includes data provided by more than 200 registered rheumatologists. The registry data have now been integrated into the EULAR COVID-19 Database, which is itself part of a global effort to better understand and optimally manage RMD patients during the pandemic. The data looked at similar outcomes and found quite similar results



The initial data are reassuring in that the majority of cases of COVID reported to EULAR COVID-19 database have recovered, including those who were hospitalized. Current EULAR advice is to continue treatment with glucocorticoids in patients who are being chronically treated, but to use them at the lowest possible dose. The objectives of this first analysis of the German registry was to provide a description of the patients who did and did not require hospitalization and those who needed ventilation, as well as look at possible risk factors

for hospitalization.

Of 192 patients they included – all with a positive lab test for SARS-CoV-2 – 128 (67%) did not require hospital admission. Of those that did (n = 64), 43 (22%)

did not need ventilation and 21 (11%) did. Fifteen patients died, all of whom had been hospitalized, and all but one of them had needed ventilation. Concerning the characteristics of the patients, those who needed hospital treatment with and without ventilation were older than those who were not admitted (70 vs. 65 vs. 54 years, respectively). Looking at the sexes, the gender

distribution is also interesting, 69% females in the non-hospitalized patients, 65% of the inpatients without ventilation, but only 43% females in the ventilated patients.

Thus, in this group, the male patients are the majority. Just over half of all patients in the nonhospitalized and the hospitalized without ventilation groups had IRD in remission, but those in the hospitalized with ventilation group less than one-fifth had their IRD under control.

The majority of patients in each of the three groups had RA (47%, 56%, and 57%), followed by psoriatic arthritis (19%, 7%, and 14%), axial spondyloarthritis (11%, 5%, and 0%), systemic lupus erythematosus (6%, 2%, and 0%), and vasculitis (1%, 5%, and 5%).

Patients who were hospitalized with and without ventilation were more likely to have more than one comorbidity than those who were not hospitalized with COVID-19.

The most frequent comorbidity was cardiovascular disease with 58% and 76% in the inpatient groups. One-third of the nonhospitalized patients had a cardiovascular comorbidity. 38% of the ventilator patients had an underlying pulmonary disease. This was in comparison with 19% of the hospitalized without ventilation and 13% of the nonhospitalized patients. Diabetes was another common comorbidity in hospitalized patients with (16%) and without (19%) ventilation versus just 2% of nonhospitalized patients. While these and other comorbidities such as chronic renal insufficiency were associated with higher odds ratios in the multivariate risk factor analysis, they did not reach statistical significance.

Regarding RMD treatments, more than 60% of patients in the hospitalized group had received treatment with glucocorticoids versus 37% of those who did not get admitted. No differences were seen for the other treatments. Interestingly, female sex, remission, and use of NSAIDs have an odds ratio smaller than 1. Hence, there might be a lower risk of hospitalization associated with these factors.



Successful conservative treatment of a soccer player with multiple-level spondylolysis: A Case report:

An 18-year-old adolescent professional soccer player gradually developed unprovoked lumbar pain after a 90-minute match. The back pain did not improve with oral analgesics, and it increased in intensity after the match. It was the second time he presented with occasional back pain that was aggravated by activity. Pain did not appear after walking or after training. He denied any radicular pain. There was no history of trauma. A few years earlier this patient had nonspecific lumbar pain complaints after a soccer match for which he consulted his general practitioner. No further examination was done at that time. A short period of rest and physical therapy made the pain disappear. Continuation of lumbopelvic core stabilization training (LPST) provided beneficial effects. During physical examination

the patient showed very good muscle strength in the lower limbs. Sensitivity and reflexes in the lower limbs were symmetrical and normal. There was no Babinski sign. He had midline tenderness along the upper lumbar spine and pain with lumbar spine extension.

Lumbar rotation to the right side was also painful. Range of motion of the lumbar spine was decreased in end-range flexion and extension.

Lateral plain radiographs of the lumbar spine showed an L4-L5 bilateral pars interarticularis defect (Figure 1). An MRI of the lumbosacral spine showed normal results of the spinal cord and lumbar discs and no foraminal narrowing. There was edema on the T2 sequences within both pedicles of L3 as well as in the adjacent soft tissues that was consistent with acute bilateral pars interarticularis fractures at L3. No edema was noted at pars interarticularis defects at L4-L5, which suggested bilateral chronic nonunion of the pars interarticularis (Figure 2).

A single photon emission CT (SPECT) scan showed increased uptake at L3 pars bilaterally, with the right side greater than the left. L4 pars showed minimal increased uptake, and L5 pars showed no increased uptake (Figure 3). There was marginal sclerosis at the L5 and minor sclerosis in L4, but not in the L3 pars, which suggested that the L3 fracture was acute, while the L4 and lesser L5 fracture were chronic. The physiotherapy regimen for this patient included restriction of activity, especially taking care to avoid overhead or lumbar extension movements. Lumbopelvic stabilization training was also restricted for 12 wk. Nonsteroidal anti-inflammatory drugs were prescribed for 10 days. At the 3-month follow-up evaluation, the patient reported no back pain. CT images of the L3 pars interarticularis fracture showed incomplete bony union.

Fig1. Lateral lumbar spine radiograph showing pars interarticularis defects at L4-L5. Arrows indicate fracture

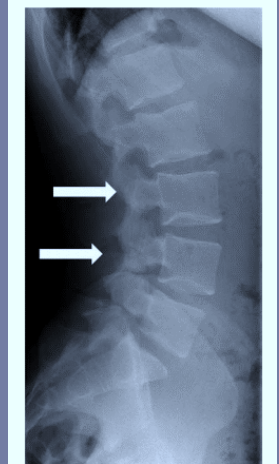
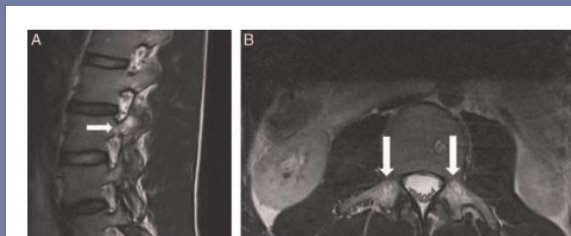


Fig 2. T2-weighted sagittal MRI sequence showing edema surrounding L3 pars fracture (A, sagittal view and B, an axial view), which is tracking along the adjacent soft tissues and chronic L4-L5 pars defect with fluid in the adjacent facet joint but with no surrounding edema. Arrows indicate focus on the spot of the vertebrae where the fracture is located.



Since the patient was pain free in daily activities as well as on lumbar flexion and extension during the physical examination, therapeutic exercise, including low-impact aerobic conditioning exercises, consisting of abdominal strengthening, pelvic tilts, and hamstring stretching, was restarted. At the 5-month follow-up evaluation, the soccer player returned to sport. At 10-month follow-up he reported no pain while playing.

DISCUSSION

Similar to that of single-level spondylolysis, the cause of multiple-level lumbar spondylolysis is thought to be fatigue fractures.^{2,4} Only a few reports of multiple-level lumbar spondylolysis have been published.⁴ While Wong⁵ and Dunn et al.⁶ described patients with two-level spondylolysis who were treated successfully with conservative methods, this is the first case report of a patient with three-level bilateral spondylolysis who was treated successfully in a conservative way. Lumbosacral radiographs have limited effectiveness in the diagnosis of spondylolysis. For the early diagnosis of active spondylolysis, bone scintigraphy is a more sensitive tool. Increased uptake can occur for 1 yr after the fracture.⁷ Multiple-level lumbar spondylolysis occurs mainly at L3–5,^{1,6} and can be treated with conservative management or surgery.

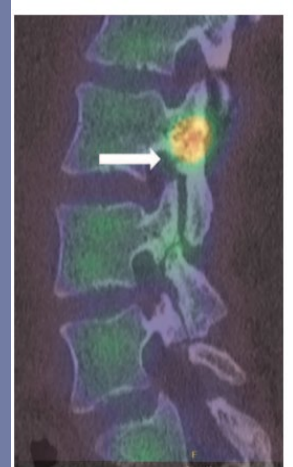
In a meta-analysis of 15 studies assessing long-term clinical outcomes, Klein et al.⁸ found a pooled success rate of 83.9% with conservative care. Bracing does not seem to influence this outcome.⁸ Selhorst et al.³ found that patients with multiple vertebral levels injured were approximately 11 times more likely to have a poor long-term outcome. Athletes with an early or progressive stage of spondylolysis should be advised to rest for 3 mo because of the strong potential for healing and with the aim of achieving bony union, especially in unilateral fractures. Nonunion does not seem to compromise the overall outcome in the short term and does not mean that the segment is unstable. Fibrous healing can occur and may lead to a good clinical result.

CONCLUSION

There is a greater healing rate in acute lesions with signs of active healing or minimal separation when compared to chronic lesions with separation or pseudarthrosis. Therefore, physicians can treat acute lesions in a more conservative way. Limitation to this case report was the short duration of follow up, which was 10 months. To compare outcomes of operative versus nonoperative treatment, additional long-term data are needed

Ref : Current Orthopaedic Practice: May/June 2020 - Volume 31 - Issue 3 - p 315-317 doi: 10.1097/BCO.0000000000000857

Fig 3 Sagittal single photon emission CT reconstruction showing more acute L3 pars interarticularis fracture with irregular hazy edges and chronic L4-L5 pars interarticularis defect. Arrow indicates edema





IN THE NEWS

The Artificial Intelligence System accuracy in determining the Radiographic stage of Knee Osteoarthritis

After total knee replacement, skin numbness occurs from injury of the infrapatellar branch of saphenous nerve (IPBSN) and/or the anterior-inferior branch of the femoral cutaneous nerve (AIBFN) and may affect the patient outcomes.

Within the last decade, rapid development of artificial neural networks and machine reading programs and their introduction into medical practice is reported.

Recently, an innovative program, based on the artificial intelligence (AI) technologies (a neural network and machine reading) that analyses knee X-ray images for determining the radiographic stage of OA was created. It was launched on the Osteoscan.ru website and is available for use by patients and doctors.

The artificial intelligence system will compare an X-ray of the knee joint with 1300 images on which the system was trained, and will offer to take a survey. Based on the obtained data, a conclusion will be made about the degree of osteoarthritis that this x-ray picture can correspond to.



Osteoscan helps people get more information about osteoarthritis: the causes of its occurrence, the principles of diagnosis, methods of treatment and prevention.

To validate the system ability to accurately stage OA through machine interpretation of standard knee radiographs, initially, 1300 x-rays of both knee joints were used to teach the neural network. Of these, 350 were presented in the form of film scans, 950 in the DICOM format.

The accuracy of the system in recognition of OA stage by knee radiographs was evaluated on a quality control sample of 130 cases (of all 1300). Independently, the radiographs were assessed by certified radiologists (considered the “gold standard”) and the System.

Results showed that in 124 out of 130 cases the conclusion of a specialist and the System was the same, which represents 95.4% predictive power.

Osteoscan, an artificial intelligence program, determines the radiographic stage of knee osteoarthritis with 95% accuracy, indicate findings from the EULAR 2020 E-Congress

Coincidence or discrepancy is a qualitative attribute, so, the accuracy of the estimation was calculated. Assuming a discrepancy of 0, and coincidence - of 1, $\mu = 0,954$, the standard error $sp = 1.8\%$. It can be concluded that in 95% of cases the accuracy of the system assessment will be in the range from 91.8% to 99%.

Conclusion: Osteoscan is a program developed on the base of AI technologies, analyzes radiographic images of the knee joints for determining OA stage. It provides high accuracy in OA stage determining by assessing knee radiographs, in 95% of cases, the accuracy of the system varies from 91.8% to 99%.

Ref: 10.1136/annrheumdis-2020-eular.4424



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