OPEN ACCESS Freely available online

Lupus: Open Access

Short Communication

Enhancement of Discoid lateral Meniscus and its Diagnosis and Treatment

Jigme Wangchuck*

Department of Pharmaceutical Analysis, Royal Thimphu College, Ngabiphu, Thimphu, Bhutan

ABOUT THE STUDY

The purpose of the current study is to develop software that will enable the diagnosis of discoid lateral menisci on knee joint radiograph pictures. A total of 160 pictures from healthy people and people who had discoid lateral menisci diagnosed were used. Preprocessing and measuring are two aspects of our software implementation. In the initial stage, the entire radiological image was examined to gather fundamental data on the patient. The knee joint was separated from the original radiological image using machine learning. Tools for picture strengthening and denoising were applied to reduce noise [1].

Edge detection was employed in the second step to quantify significant features in the image. The creation of a model of the knee joint and the measurement of its characteristics were done using a specialized algorithm. 99.65% of the test photos had accurate segmentation. Additionally, 97.5% of the tested photos had effective parameter measurements and accurate segmentation. In the discoid and control groups, there was no visible difference between manual and automatic measures. The results of manual measurement were contrasted with the mean and standard deviations of the ratio of the lateral joint space distance to the height of the lateral tibial spine [2].

On unprocessed radiographs, the software functioned admirably, displaying a gratifying success rate and robustness. Therefore, using technologies connected to artificial intelligence and radiograph-image analysis software (such as BM3D, etc.), it is possible to diagnose discoid lateral menisci on radiographs. Future diagnoses of discoid lateral menisci and other knee joint illnesses may benefit from the findings of this study, which can be used to create a joint database with patient data [3].

The discoid lateral meniscus is a type of knee anatomy that covers more of the tibial plateau than the regular meniscus does. Studies show that a discoid lateral meniscus increases the risk of meniscal tears, which can cause symptoms like discomfort, clicking, swelling, articular block, restricted knee extension, meniscal instability, and meniscal cyst formation [4].

Magnetic Resonance Imaging (MRI) findings and the patient's symptoms must be taken into account while diagnosing discoid lateral meniscus, which is a somewhat prevalent condition. However, there are a number of drawbacks to using MRI when operating. Even in large general hospitals where MRI is frequently used for diagnosis and may not be available in every primary care facility, patients still experience the inconvenience of having to wait for appointments [5].

Patients who have magnetic metallic implants or claustrophobia should not undergo an MRI. All of these elements make it necessary to diagnose discoid lateral meniscus on radiographs, which are more widely used, more practical, and have fewer side effects than MRI. On radiographs, a novel technique for identifying discoid lateral menisci was introduced. In order to distinguish between normal and pathological knees, a number of geometric angles and distances were measured from the anteroposterior view of plain knee radiographs. The following parameters were thus found to be significantly different: Chordal Distance of the Femoral Condyle (CDLF), Height of the Fibular Head (HFH), Lateral Joint Space Distance (LJSD), Height of the Lateral Tibial Spine (HLTS), Distance from the Lateral Tibial spine to the lateral femoral condyle (DLC), and LJSD/HLTS [6].

CONCLUSION

Since this ratio was determined to have the most significant difference between patients who were diagnosed with discoid lateral menisci and normal persons, it would be helpful to automate the calculation of LJSD/HLTS utilising software. Prior research on computer-assisted knee joint analysis and radiograph image processing was done. In order to create a spatial model of the knee joint, Kalinosky et al., used image processing techniques to construct a thorough method for quantifying the tibiofemoral joint space on radiographs. Other studies that examined knee radiographs for osteoarthritis included those by Shamir, who described the characteristics of the pictures using a variety of image classification techniques, and Lee et al., who computed the geometric parameters of the knee radiograph using an active shape model.

Correspondence to: Jigme Wangchuck, Department of Pharmaceutical Analysis, Royal Thimphu College, Ngabiphu, Thimphu, Bhutan, E-mail: jigmewangchuck@gmail.com

Received: 14-Nov-2022, Manuscript No. LOA-22-20835; **Editor assigned:** 17-Nov-2022, PreQC No. LOA-22-20835 (PQ); **Reviewed:** 09-Dec-2022, QC No. LOA-22-20835; **Revised:** 16-Dec-2022, Manuscript No. LOA-22-20835 (R); **Published:** 23-Dec-2022, DOI: 10.35248/2684-1630.22.7.218

Citation: Wangchuck J (2022) Enhancement of Discoid lateral Meniscus and its Diagnosis and Treatment. Lupus: Open Access. 07:218

REFERENCES

1. Persiani P, Mariani M, Crostelli M, Mascello D, Mazza O, Ranaldi FM, et al. Can early diagnosis and partial meniscectomy improve quality of life in patients with lateral discoid meniscus?. Clin Ter. 2013;1;164(5):e359-364.
2. Jiang W, Li X, Su H, Yang C. A new method to diagnose discoid lateral menisci on radiographs. Knee Surg Sports Traumatol Arthrosc. 2016;24(5):1519-1524.
3. Kalinosky B, Sabol JM, Piacsek K, Heckel B, Gilat Schmidt T. Quantifying the tibiofemoral joint space using x-ray tomosynthesis. Med Phy. 2011;38(12):6672-6682.
4. Shamir L, Ling SM, Scott WW, Bos A, Orlov N, Macura TJ, et al. Knee x-ray image analysis method for automated detection of osteoarthritis. IEEE Trans Biomed Eng. 2008;56(2):407-415.
5. Lee HC, Lee JS, Lin MC, Wu CH, Sun YN. Automatic assessment of knee osteoarthritis parameters from two-dimensional x-ray image. InFirst International Conference on Innovative Computing, Information and Control-Volume I (ICICIC'06). 2006;2:673-676. IEEE.
6. Green O. Efficient scalable median filtering using histogram-based operations. IEEE Trans Image Process. 2017;27(5):2217-2228.