

RADIOLOGICAL CORRELATION WITH CLINICAL OUTCOME IN PATIENTS OF DISCITIS AT A TERTIARY CARE CENTER

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ABSTRACT

Background: Infection of intervertebral disc space occurs due to various reasons in post op patients. Discitis is a serious condition as it causes excruciating pain with movement hampering daily routine of patients. It occurs due to infection during the surgical procedure or afterwards during the hospital stay or sometimes even one year after the surgery. In this study we tried to figure out the correlation between its investigation of choice i.e MRI findings with clinical outcome. **Materials and Methods:** 64 patients having discitis in the last two year period were studied retrospectively from our institute. They were studied for their clinical, radiological and lab features. All of these patients were operated for disc prolapse at single or multiple levels with or without instrumentation. On clinical ground they were studied for their symptoms like pain on various pain scales, fever. In radiology they were assessed with preop and post op MRI upon development of discitis and these MRI findings are compared with C- reactive protein as a marker of inflammation. **Result:** Patients having consistent pain were found to have raised c- reactive protein level compared to other normal patients. The mean C reactive protein level in our study was 18 and it was statistically significant. Out of total 64 patients 26 showed ring enhancement on contrast MRI. 28 of our patients experienced continuous excruciating pain while remaining experienced moderate to minimal pain. **Conclusion:** From our study we have concluded that reduction in height of adjoining vertebrae, contrast enhancement of disc margins and surrounding tissue and raised C- reactive protein levels definitively indicates towards discitis as a cause of excruciating pain in patients.

INTRODUCTION

It is found that in many studies patients having other coexisting conditions like some immunodeficiency or immunocompromised due to HIV infection, drug abusers,^[1] are more prone to develop disc space infection after operation. Old age people are also more prone to develop discitis. Development of frank pus is rare but not uncommon. Infection occurring in post op period is more likely due to iatrogenic causes.^[2] Remotely occurring infection may be blood borne, infection of some other tissue nearby the disc or occurring de novo due to lack of proper hygienic measures. Most common causative agent in Indian setting is found to be *S. aureus*. Most common site of discitis is lumbar spine followed by cervical spine to the less extent. Other studies have found the incidence of discitis up to 18 percent. MRI is the radiological investigation of choice in discitis patient. It shows reduce height of vertebral bodies, ring like enhancement of disc space, deposition of fat around

the disc in vertebrae, and irregular enhancement of surrounding tissue.^[3] There are not many studies on prognosticating value of MRI findings in discitis patients on their clinical progress with treatment.^[4] In this study we tried to have correlation between MRI findings with clinical status of patient and its progress with treatment.^[5]

MATERIALS AND METHODS

This is a retrospective study conducted at tertiary care center studying patient records from Jan 2022 to Dec 2025. Patients were studied for their various clinical parameters. Patients above 18 years of age were included in this study, other criteria for inclusion are MRI showing discitis changes, clinical and lab profile of infection, patient operated recently for spine i.e surgery in 6 months period of infection. Age group less than 18 years was excluded also number of patients operated for disc in this age group were negligible. Patients having discitis without surgery

were excluded. Contrast MRI was the mainstay of diagnosis of discitis with supporting lab findings. CT was also done to study bony anatomy for erosion around disc space, reduction in vertebral body height and reduction in disc space. Diagnostic tapping and blood culture were also studied. MRI generally showed three types of enhancement 1) Only bony enhancement 2) Soft tissue and dura enhancement 3) Ring enhancement with abscess. Other clinical findings like focal deficit were noted. Other concomitant diseases causing immunodeficiency due to various causes were also noted. Patients were treated with antibiotics as per the culture when inpatient and also given antibiotics upon discharge for 21 days. All patient were followed up with CRP levels. Outcome analysis was done using pain analogue scale and CRP levels. Follow up MRI was done to see improvement in the discitis features. Relief from pain and reduction in CRP values is considered as a good outcome. Various statistical tests were applied to analyse the data.

RESULTS

Sixty four patients were studied retrospectively from the patient records based on MRI findings, Lab findings and clinical profile for the period of 4 years. Infections other than pyogenic one are excluded from this study. All the patients were having episodes of discitis in the 3 months post op period for disc with or without instrumentation. Involvement of lumbar spine was found in 56 patients and discitis in lower dorsal was found in 8 patients. Average age group in our study sample was 57 years. 40 patients were male while 24 were female.

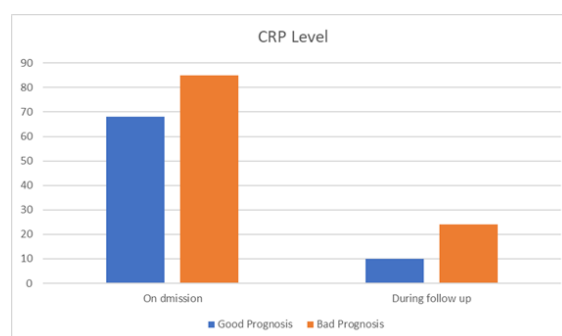
Out of 64 patients in this study group 50 patients recovered with proper treatment and care while 14 patients showed poor response and outcome. CRP levels were near normal in patients with good outcome while in others they were raised. We put MRI findings of patients in two groups based on their pain perception after treatment for discitis. 36 patients had no pain or minimal pain without painkillers while 28 patients had to resort to some for of painkillers for relief of pain. Out of these patients 38 needed redo surgery while 26 recovered conservatively. All the results are tabulated in the following tables.

DISCUSSION

MRI is the investigation of choice to diagnose discitis along with clinical profile and laboratory markers. In our study we did MRI of all patients to look for signs of discitis along with c reactive protein, pyogenic organism in blood culture, or culture from local collection. In various studies previously conducted on discitis the rate of infection is up to eighteen percent⁶ with higher rate found in cases where instrumentation is done. Patients developing infective discitis may have infection by two

possibilities. First is infection introduced de novo during the surgery due to various causes and second is patient having previous infection somewhere which spread to the disc site. Patients having weak immunity due to various causes are more susceptible to the spread of infection.

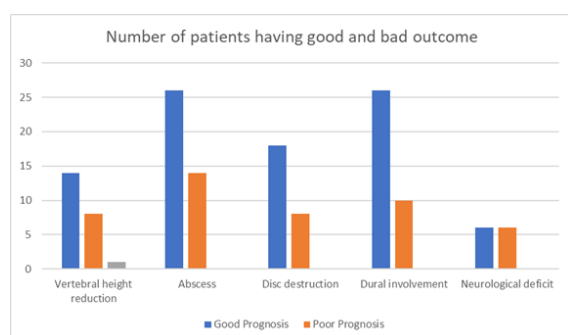
Discitis is known to happen due to many causes in post op period which include diabetes, use of immunosuppressants and steroids for other diseases, other preexisting malignant diseases, patients with kidney disorders, and immunocompromised patients.^[7] In our study the average age of patients was 57 years and males outnumbered females, other studies reported similar findings.^[8] We found that any particular age group does not have any significant incidence of discitis similar to other studies. Other comorbidities have played an important role in development of discitis. C reactive protein is the most reliable biomarker for the degree of inflammation and also to assess the treatment response by patient.^[9,10] We did C reactive protein assay on 15 days follow up and if showed value 10 or less it indicated good outcome. And values more than 10 are considered to have bad outcome with patients having episodes of severe pain due to discitis. Also we observed that follow up MRI on 15 days does not show features of discitis in corroboration with c reactive protein.



Antibiotic treatment was needed to patients in whom c reactive protein level did not come back to normal level during follow up, in some patients prolonged treatment was needed for resolution of symptoms. Due to prolonged discitis there is decrease in vertebral height due to destruction of end plates and vertebral bodies leading to prolonged pain and poor prognosis. Many other studies on the same topic have focused on various attributes to correlate these include symptoms duration, age group, other comorbidities, and focal neurological deficit to compare with the outcome of the patient. But as MRI is the most specific modality of investigation we considered it for diagnosing discitis in the initial period also to identify patients which may have poor prognosis. A triad of findings i.e MRI features, C reactive protein level, and excruciating pain indicates towards the modality of treatment needed.

MRI findings shows compression of cord or nerve roots, and also there inflammation. Nerve root and spinal cord inflammation can increase pain perception by releasing inflammatory mediators

which further heightens the pain perception. Chronic pain may lead to some neuroplastic changes in the nervous system making it more sensitive to trivial stimulus of pain. This can be linked to anatomical changes and biochemical processes like increased ESR, CRP.^[11-14] Basic understanding of the chemical markers and radiological findings and their correlation with each other may form the basis of specific treatment modalities. For example. In patients with increased biochemical markers with anatomical changes on MRI may suggest use of anti-inflammatory drugs and other modalities to reduce inflammation. Many studies have pointed out that presence of local collection in and around the disc space and neurological deficits needed surgical intervention,^[15] we observed similar finding and patients improved symptomatically after surgical intervention.



Uchida et al. found out two types of infection and inflammation patterns, the first one is diffuse enhancement of surrounding tissue which indicates early stage of infection and the other one is the second stage where proper abscess formation has occurred with ring like enhancement.^[16,17] Severity of symptoms is found to be more with second pattern. We also found similar findings in our study. Many studies have also noted that in post op discitis patients there is dural enhancement around the disc involved and this enhancement remains even after patient gets relief from symptoms.^[18] We noted in our study that dural enhancement which remains in symptomatically improved patients does not have any effect on prognosis of patient.

CONCLUSION

In this study we have found the importance of correlation of clinical findings with radiology and biochemical markers like C reactive protein in detecting and treating the patients of discitis in post op period and their further prognosis. Biochemical markers of inflammation like CRP, ESR play pivotal role in assessing the response to treatment and their future clinical outcome. Also contrast MRI is the key to early detection of discitis cases.

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