SELECTIVE SYNOVIAL BIOPSY IN CHRONIC SYNOVITIS KNEE – A STUDY

G. Raghunandan¹, K. B. Vijayamohan Reddy², A. M. Ilias Basha³, G. Praneeth Kumar Reddy⁴

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ABSTRACT: Arthroscopy assisted selective synovial biopsy was performed in 40 Patients with chronic synovitis of the knee presented to Orthopaedic outpatient department at Government General Hospital, Kurnool. Common histo-morphological patterns observed were non-specific type and tuberculosis. The procedure is safe with no morbidity and possibly helpful in early diagnosis of synovial pathology avoiding the complications of open surgery.

KEYWORDS: Synovitis, arthroscopy, biopsy.

INTRODUCTION: Synovitis is one of the commonest conditions affecting the knee joint in present day orthopaedic outpatient practice. Most of the cases are due chronic inflammatory changes in the synovium causing synovial effusion and hypertrophy. The common aetiopathological factor is a non-specific inflammation but specific chronic inflammatory disorders like Tuberculosis, Rheumatoid arthritis, Gouty synovitis,¹,² and Villonodular synovitis which requires treatment in definitive lines should also be considered while choosing treatment options.

The diagnosis is made by synovial biopsy, an open or closed procedure. The material obtained by needle biopsy is often inadequate for getting histomorphology and open procedures are associated with some degree of morbidity and risk of infection.

Arthroscopic assisted selective synovial biopsy is a procedure in which the synovium is biopsied from the site of suspected lesion and the specificity to obtain a representative sample of the pathology is high and hence chances of missing diagnosis is remote.³,² It is also superior to open technique due to least morbidity and combines the advantage of therapeutic synovectomy in needed cases.

This study is intended to evaluate the results of arthroscopy assisted selective synovial biopsy and to discuss the importance of diagnostic arthroscopy in inflammatory disorders of the synovium.

MATERIAL AND METHODS: The study included selective synovial biopsy in 40 cases of inflammatory synovitis of the knee who presented to Government General Hospital, Kurnool between 2010 and 2012. All the patients who had chronic synovitis of more than 3 weeks duration were included in the study. The patients having fixed flexion deformity, acute synovitis, children below 12 years, asymptomatic synovitis are excluded from the study. All the patients had X-ray evaluation of the knee for possible arthritic changes and other associated calcifications and loose bodies. Synovial fluid is aspirated and sent for Gram’s staining and Ziehl Neilsen stain. Fluid is subjected to cell count. Biopsy is planned on elective basis.
After general investigations, procedure is planned under arthroscopic guidance. All surgeries were done under spinal anaesthesia under tourniquet control. Standard Anterolateral and Antero medial portals were used.\(^4,5,6\) Diagnostic arthroscopy\(^7,4,6\) was performed concentrating on suspected focal areas of pathology in synovium.\(^7,2\) Biopsy is obtained from different places like supra patellar pouch, medial and lateral gutters and from patellar margins. Material is sent for histo-pathological examination. Knee is irrigated and sterile compression bandage applied. Post operatively, weight bearing and knee movement was allowed as tolerated by the patient. The histo-pathological reports were presented, analysed and discussed. Clinical follow up period ranged from 6 weeks to 2 years.

RESULTS:
In the present series, the following results are obtained.
There were 25 males and 15 females with male: female ratio of 5:3
The age distribution is illustrated in table 1.

The aetiological diagnosis in comparison to age and sex is as follows.

| Age in years | Number (n=40) | Percentage |
|--------------|--------------|------------|
| < 20         | 2            | 5          |
| 21-30        | 4            | 10         |
| 31-40        | 12           | 30         |
| 41-50        | 16           | 40         |
| Over 50      | 6            | 15         |

Table 1: Age Distribution

The period of hospitalization required, ranged from 1-3 days and 22 patients (55%) could be discharged on the same day, making the procedure suitable for day care surgery.
No significant complications were encountered in our series, except for haemarthrosis in 4 cases which subsided after aspiration and compression bandage.

| Diagnosis                      | Age distribution in years | Total number | Male | %   | Female | %   |
|--------------------------------|----------------------------|--------------|------|-----|--------|-----|
| Chronic non-specific synovitis | 20-44                      | 25           | 16   | 64  | 9      | 36  |
| Tuberculous synovitis          | 25-40                      | 6            | 4    | 66.6| 2      | 33.3|
| Rheumatoid arthritis           | 22-45                      | 5            | 2    | 40  | 3      | 60  |
| Pigmented villonodular synovitis| 38                         | 1            | 0    | 1   | 100    |     |
| Gouty synovitis                | 40                         | 1            | 1    | 100 | 0      | -   |
| Synovial Chondromatosis        | 35                         | 1            | 1    | 100 | 0      | -   |
| Synovial sarcoma               | 35                         | 1            | 1    | 100 | 0      | -   |

Table 2: Aetiological diagnosis in comparison to age and sex
The complications are illustrated in table 3.

| Complication     | Number | Percentage |
|------------------|--------|------------|
| Haemarthrosis    | 4      | 10         |
| Sterile effusion | 3      | 7.5        |
| Wound infection  | 1      | 2.5        |
| Knee stiffness   | 0      | 1          |
| Synovial fistula | 1      | 2.5        |

Table 3: Complications

**DISCUSSION:** Inflammatory synovitis of the knee is the commonest clinical presentation in day to day orthopaedic clinical practice. The aetiology remains unclear and may influence treatment protocol if the diagnosis could not be arrived at, after synovial fluid aspiration and other techniques of synovial biopsy like FNABC and needle biopsy.\(^7^,^3^,^8^\) Open biopsy of the synovium has in built risk of infection and delays the rehabilitation programme.

In this series, arthroscopic assisted synovial biopsy is performed to obtain a sample of the tissue directly under vision from the suspected site of pathology.

A total of 40 patients with synovitis of the knee are included in the present study. Male to female ratios in relation to aetiology are, 4:3 in chronic non-specific synovitis, 2:1 in Tuberculous synovitis and 1:2 in Rheumatoid synovitis. We have reported Pigmented Villonodular synovitis in a female of 38 years age and Synovial sarcoma in a male of 35 years.

The maximum number of synovitides occurred in the age group of 31-50 years, 28 patients (70%) as is also observed in Onis Singhal series.\(^2^\) Non-specific synovitis was the aetiology in 25 patients (62.5%) followed by Tuberculosis in 6 cases (15%). Out of 25 patients, 16 were males in non-specific synovitis group (64%) and females were 9(34%). In contrast, Rheumatoid synovitis is predominantly seen in females, 3 (60%), in total of 5 cases. In the series reported by Onis Singhal et al,\(^2^\) the reported incidence of Rheumatoid aetiology was in 14 cases and Tuberculous synovitis was seen in 13 cases (n=50). Pigmented villonodular synovitis is a pigment disorder of the synovium, seen in middle age group and in our study, we had only one case (2.5%), in female of 38 years. This patient had developed synovial fistula, which spontaneously healed in 3 weeks’ time. Similar incidence of Pigmented Villonodular synovitis was reported by Onis Singhal et. al,\(^2^\) in 1 patient, among a study group of 50. Gouty synovitis was seen in one case, a 35 years male who also had metacarpophalangeal joint involvement of the great toe on the same side. One case of synovial sarcoma was reported in the present study in a male patient aged 48 years who later developed superficial infection and knee stiffness in final degrees of flexion. This patient was lost to follow up and the outcome is not known. With a limited sample in the present series, it is difficult to infer but probably arthroscopic assisted biopsy is helpful in early diagnosis of these malignant lesions.

There were some associated lesions in the patients, which were revealed on arthroscopic evaluation, degenerative tears of posterior horn of medial meniscus in 8 cases with non-specific synovitis and 10 patients in the whole series had partial ACL tear, evidenced by ACL laxity.
patients with Tuberculous synovitis, 2 had posterior medial meniscal tears. The meniscal tears were excised and balanced during the biopsy procedure, since it allows treatment of incidental meniscal pathology. We have not done arthroscopic synovectomy in our series.

There were no major complications in our series. Haemarthrosis was observed in 4 (10%), which was managed with aspiration and compression bandage. 3 patients presented with joint effusions 10 days after the initial biopsy procedure. The aspirate was sterile and swelling could be managed with compression bandage. One patient developed superficial infection, in which the diagnosis was Synovial sarcoma, was treated with dressings and antibiotics; however, the patient was lost to follow up. In a series reported by D Kane et al, the infection rate was reported as 0.1% and haemarthrosis was 0.9%. We also had synovial fistula in one patient which got healed up spontaneously.

**SUMMARY AND CONCLUSIONS:** Arthroscopy assisted selective synovial biopsy in synovial inflammatory conditions, performed in 40 patients is presented in this study. The procedure is less morbid with a low period of hospitalization. Male predominance is seen in chronic non-specific type and Rheumatoid Synovitis was common in females. Tuberculosis is the aetiology in 6 patients. Arthroscopy enables the surgeon to select the site of biopsy avoiding missing the lesion. The procedure is safe, simple, can be carried out on day care basis and offers the advantage of early functional recovery and possible diagnosis of the aetiological lesion in early stages of the disease, facilitating the treatment and good functional recovery.

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AUTHORS:
1. G. Raghunandan
2. K. B. Vijayamohan Reddy
3. A. M. Ilias Basha
4. G. Praneeth Kumar Reddy

PARTICULARS OF CONTRIBUTORS:
1. Professor, Department of Orthopaedics, Kurnool Medical College, Kurnool, Andhra Pradesh.
2. Assistant Professor, Department of Orthopaedics, Kurnool Medical College, Kurnool, Andhra Pradesh.
3. Assistant Professor, Department of Orthopaedics, Kurnool Medical College, Kurnool, Andhra Pradesh.
4. Post Graduate, Department of Orthopaedics, Kurnool Medical College, Kurnool, Andhra Pradesh.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:
Dr. G. Raghunandan,
Professor,
Department of Orthopaedics,
Kurnool Medical College,
Kurnool - 518002, Andhra Pradesh.
E-mail: orthoraghu@yahoo.co.uk

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