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*RESEARCH ARTICLE*

# DOES ULTRASONOGRAPHY GUIDED STEROID INJECTIONS PROVIDE BETTER OUTCOME IN SHOULDER IMPINGEMENT SYNDROME? A PROSPECTIVE STUDY

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## *Abstract*

Shoulder pain is the third most common musculoskeletal complaint in orthopedic practice and impingement syndrome is one of the more common underlying diagnosis(1). Neers classification system is used as a criteria for diagnosis. The affected patients are generally over age 40(1). Patients present with pain on elevating the arm or when lying on the affected side. Individuals will often present with complaints of pain upon lifting the arm or with lying on the affected side. They may report loss of motion as the primary reason they come in to be evaluated, or that nighttime pain prevents them from sleeping. Weakness and stiffness often result secondary to the pain(1,2). The decision to treat conservatively or surgically is generally made on the basis of the duration and severity of pain, the degree of functional disturbance, and the extent of structural damage. The goal of treatment is to restore pain-free and powerful movement of the shoulder joint.(1) There is a wide variety of conservative treatments for SIS ranging from different physiotherapy modalities such as joint mobilisation techniques and strengthening exercises, adaptations of daily activities, non-steroidal anti-inflammatory drugs (NSAIDs) as well as steroid injections(4). Subacromial corticosteroid injection (CSI) is a popular SIS treatment method amongst orthopaedists, rheumatologists and general practitioners(5). This method is regarded as an inexpensive and effective way to both diagnose and treat symptomatic rotator cuff disease and SIS (6). Therapeutic effects of CSI on pain, inflammation and range of motion (ROM) have mostly been observed as being limited to a short-term effect (7). It is important to increase the accuracy rate of the steroid injection to get a better clinical outcome in relieving pain and improving function. This study intends to find out the superiority of USG guided subacromial steroid injection over landmark guided subacromial steroid injection in shoulder impingement syndrome. Objective of the study- To compare the difference between Ultrasound guided and landmark guided steroid injection , with the hypothesis that ultrasound guided injection technique has superior outcome. Methods It is an observational clinical study, carried out at a Tertiary Hospital MGM Medical college at Navi Mumbai between July 2021 and December 2021 for 6 months duration, which included 100 patients showing signs and symptoms of shoulder impingement syndrome. Patient were categorized into ultrasound

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guided subacromial steroid injection group and landmark guided subacromial steroid injection group. Written and informed consent was taken from each patient willing to be enrolled in the study. A 2 weekly, 4 weekly and 6 weekly follow up post treatment was done on an OPD basis . During each visit patients evaluation was done using SPADI (shoulder pain and disability index) score. Conclusion Improvement of shoulder function and pain was statistically significant in Ultrasound guided subacromial steroid injection as compared to landmark guided subacromial steroid injection. Therefore functional outcome of ultrasound guided subacromial steroid injection is better than landmark guided subacromial steroid injection.



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## Introduction:-

Shoulder pain is the third most common musculoskeletal complaint in orthopedic practice and impingement syndrome is one of the more common underlying diagnosis[(1)].The affected patients are generally over age 40[(1)].Shoulder impingement is a clinical syndrome in which soft tissues become painfully entrapped in the area of the shoulder joint[(1)].

Patients present with pain on elevating the arm or when lying on the affected side. Individuals will often present with complaints of pain upon lifting the arm or with lying on the affected side. They may report loss of motion as the primary reason they come in to be evaluated, or that nighttime pain prevents them from sleeping. Weakness and stiffness often result secondary to the pain[(1,2)].

On the pathophysiological level, it can have various functional, degenerative, and mechanical causes. The pathology of subacromial impingment generally relates to a chronic repetitive mechanical process in which the conjoint tendon of the rotator cuff undergoes repetitive compression and micro trauma as it passes under the coraco-acromial arch. As the arm is abducted or rotated the subacromial space width changes and the cuff becomes increasingly compressed. The supraspinatus is in closest contact to the anterior inferior border of the acromion in 90 degrees of abduction with 45 degrees internal rotation. The impingement hypothesis assumes a pathophysiological mechanism in which different structures of the shoulder joint come into mechanical conflict[(1,3)].

The decision to treat conservatively or surgically is generally made on the basis of the duration and severity of pain, the degree of functional disturbance, and the extent of structural damage. The goal of treatment is to restore pain-free and powerful movement of the shoulder joint.[(1)] There is a wide variety of conservative treatments for SIS ranging from different physiotherapy modalities such as joint mobilisation techniques and strengthening exercises, adaptations of daily activities, non-steroidal anti-inflammatory drugs (NSAIDs) as well as steroid injections[(4)]. Subacromial corticosteroid injection (CSI) is a popular SIS treatment method amongst orthopaedists, rheumatologists and general practitioners[(5)]. This method is regarded as an inexpensive and effective way to both diagnose and treat symptomatic rotator cuff disease and SIS [(6)]. Therapeutic effects of CSI on pain, inflammation and range of motion (ROM) have mostly been observed as being limited to a short-term effect [(7)].

It is important to increase the accuracy rate of the steroid injection to get a better clinical outcome in relieving pain and improving function.

This study intends to find out the superiority of USG guided subacromial steroid injection overlandmarkguidedsubacromialsteroidinjectioninshoulderimpingementsyndrome.

## Materials And Methods:-

**Sourceof data**

Out of 213 patients , 100 patients with shoulder impingement syndrome satisfying inclusion and exclusioncriteria who have been admitted or treated on outpatient basis at a tertiary centre at Navi Mumbai.

**Samplesize**
Atotal of100 patientswereenrolled.
Prevalance(p) = 40%, q= 100-40= 60
L= 10% (Absolute precision)
N= $4pq/L^2$ = 4 x 40 x 60 / $10^2$ = 100

**Inclusioncriteria and exclusion criteria**
Patients with shoulderimpingement syndrome, willingtofollow upfor6weeks were included in the study. Patients not giving consent, Patients with diagnosisotherthanshoulderimpingementsyndrome, previoussurgeryforshoulderimpingementsyndromeorforanyshoulderpathology, Patientslosttofollow up, Known comorbidities like Diabetes Mellitus ( casues frozen shoulder) , thyroid disorders, Epilepsy.

**Studydesign**
Comparativestudy- Patients were divided in two groups by systematic sampling.
Protocoloftheprocedure

**Methodology Of Usg Guided Subacromial Steroid Injection:-**
Shoulderispaintedanddrapedwithpovidineiodine.5mloflignocaine2%isdrawnina5 cc syringe and loaded with 40 mg of triamcinolone. Under USG guidance, subacromialspace is identified and steroid is injected into subacromial space. All the USG guidedinjectionswere given bythesame interventional radiologist to avoid bias.

**Methodology Of Landmark Guided Subacromial Steroid Injection**
Shoulderispaintedanddrapedwithpovidineiodine.5mloflignocaine2%isdrawnina

5ccsyringeandloadedwith40mgoftriamcinolone.Posterior-lateralborderofacromionidentified,needlepassed2cmbelowtheacromiondirectedintothesubacromialspaceandsteroidisinjectedintosubacromialspace.Allthelandmarkguidedinjections were given bythesamesurgeon.

Patientwerecategorisedbysystematicsampling into 2 groups , patients were divided alternately in ultrasoundguidedsubacromialsteroid injection group and landmark guided subacromial steroid injection group. Patients were followed post treatment on OPD basis at intervals of 2 weeks, 4 weeks and 6 weeks.During each visit patients were evaluated using SPADI (shoulder pain and disabilityindex)score. SPADI difference is the difference between 2 scores on two occasions which shows the improvement / worsening of the scores 2 weeks apart.

**Statisticalanalysis**
DatawascollectedandenteredinanExceldatasheetandwasanalysedusingindependentstudentTtest,ChisquaretestandpairedTtest.Thiswasappliedtocheckfor the presence of a significant difference in outcome variable between the two groups.SoftwareInStat version 3.10, 32 bits from Graph Pad was used for the statistical analysis.APvalueof<0.05 %was considered significant.

## Observationsandresults:-

A total of 100 patients with shoulder impingement syndrome were included in the study.Patientwerecategorisedbysystematicsamplingintoultrasoundguidedsubacromialsteroid injection group and landmark guided subacromial steroid injection group. Out of the 100 patients, 50 patients underwent ultrasound guided subacromial steroid injectiongroup and50patientsunderwent landmark guided subacromialsteroidinjectiongroup.

Age of the patients ranged from 25 years to 60 years. The mean age of patients whounderwent ultrasound guided subacromial steroid injection was 52 years and patientswhounderwentlandmarkguidedsubacromialsteroidinjectiongroup50 yearsrespectively.Comparisonoftheagebetweenthetwogroupsshowsthatageishigherin USG group with a t value of 1.389 and is statistically non significant with a p valueof0.168

Among the 100patientsinthisstudy,54patients(54%) were malesand46patients(46%) were females. Among the patients who underwent ultrasound guided subacromialsteroid injection 52% were males and 48% were females.

Among patients who underwentlandmark guided subacromial steroid injection 54% were males and 46% were females.Chisquaretest was usedforcomparisonbetweengender.

**Comparison of functional outcome between ultrasoundguided subacromial steroidinjectionwithlandmark guided subacromial steroidinjection-**

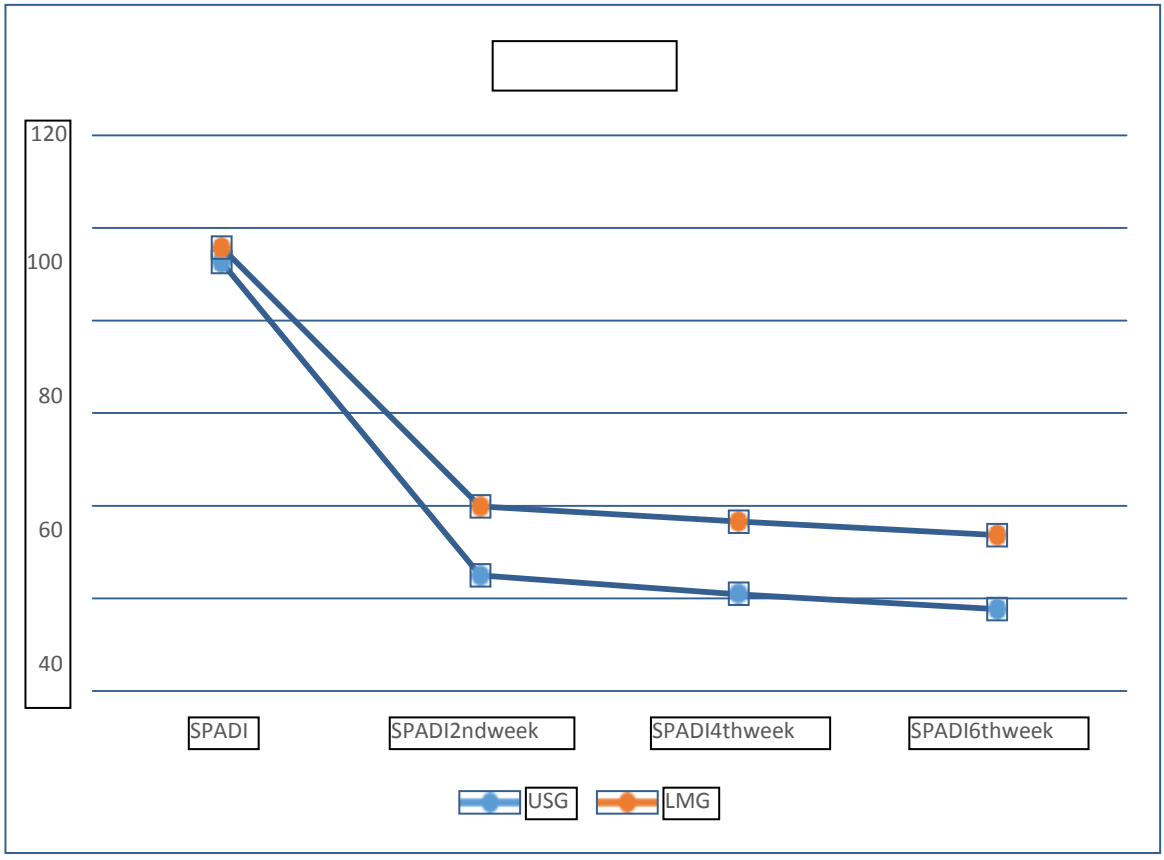
Independent student T test was used and difference was calculated between the SPADIscore.

1. Comparison of the SPADI between the two groups shows that SPADI is higher inLMGgroupwitha t value of -1.379 and is statistically nonsignificantwith a pvalue of0.173
2. Comparisonof the SPADI 2nd week between the two groups shows thatSPADI2nd week is higher in LMG group with a t value of -14.808 and is statisticallysignificantwith ap valueof<0.001
3. Comparison of the SPADI 4th week between the two groups shows that SPADI 4thweekishigherinLMGgroupwithatvalueof-17.897andisstatisticallysignificantwith ap valueof<0.001
4. Comparison of the SPADI 6th week between the two groups shows that SPADI 6thweekishigherinLMGgroupwithatvalueof-18.406andisstatisticallysignificantwith ap valueof<0.001
5. Comparison of the SPADI difference baseline to 2nd week between the two groupsshows that SPADI Difference baseline to 2nd week is higher in USG group with a tvalueof4.853 and is statisticallysignificantwithap value of<0.001
6. Comparison of the SPADI difference baseline to 4th week between the two groupsshows that SPADI difference baseline to 4th week is higher in USG group with a tvalueof5.379 and is statisticallysignificantwithap value of<0.001
7. Comparison of the SPADI difference baseline to 6th week between the two groupsshows that SPADI difference baseline to 6th week is higher in USG group with a tvalueof5.538 and is statisticallysignificantwithap value of<0.001
8. Comparison of the SPADI Difference 2nd to 4th week between the two groupsshows that SPADI difference 2nd to 4th week is higher in USG group with a t valueof2.237 and is statisticallysignificant with ap value of0.029
9. Comparison of the SPADI difference 2nd to 6th week between the two groupsshows that SPADI difference 2nd to 6th week is higher in USG group with a t valueof2.526 and is statisticallysignificant with ap value of0.013
10. ComparisonoftheSPADIdifference4thto6thweekbetweenthetwogroupsshows that SPADI difference 4th to 6th week is higher in USG group with a t valueof1.519 and is statisticallynon significant with apvalue of0.132

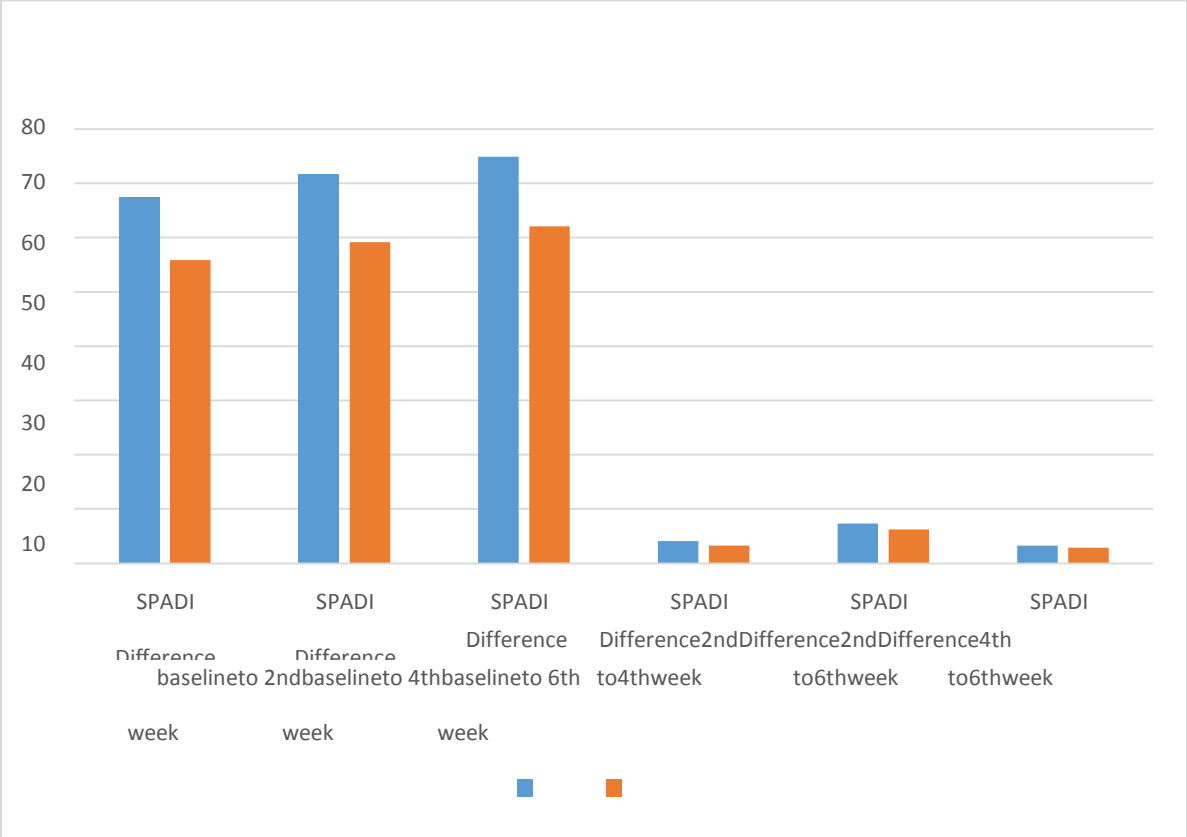
**Table1:-** ComparisonbetweenUSGguidedandLandmarkguided.

| | **OCEDURE** | **N** | **Mean** | **Std. Deviation** | **t** | **Df** | **PVALUE** |
|---|---|---|---|---|---|---|---|
| SPADI | USG | 50 | 92.580 | 14.542 | -1.379 | 64.867 | 0.173 |
| | LMG | 50 | 95.750 | 6.463 | | | |
| SPADI2nd week | USG | 50 | 25.000 | 5.363 | -14.81 | 94 | **<0.001** |
| | LMG | 50 | 39.850 | 4.419 | | | |
| SPADI4th week | USG | 50 | 20.920 | 4.375 | -17.9 | 94 | **<0.001** |
| | LMG | 50 | 36.540 | 4.177 | | | |
| SPADI6th week | USG | 50 | 17.670 | 4.239 | -18.41 | 94 | **<0.001** |
| | LMG | 50 | 33.630 | 4.256 | | | |
| SPADIDifferencebaselineto2nd | USG | 50 | 67.580 | 14.185 | 4.853 | 78.436 | **<0.001** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| week | LMG | 50 | 55.900 | 8.786 | | | |
| SPADIDifferencebaselineto4th week | USG | 50 | 71.670 | 13.590 | 5.379 | 79.057 | **<0.001** |
| | LMG | 50 | 59.210 | 8.530 | | | |
| SPADIDifferencebaselineto6th week | USG | 50 | 74.920 | 13.509 | 5.538 | 79.606 | **<0.001** |
| | LMG | 50 | 62.130 | 8.579 | | | |
| SPADIDifference2ndto4thweek | USG | 50 | 4.080 | 2.162 | 2.237 | 66.72 | **0.029** |
| | LMG | 50 | 3.310 | 1.014 | | | |
| SPADIDifference2ndto6thweek | USG | 50 | 7.330 | 2.417 | 2.526 | 94 | **0.013** |
| | LMG | 50 | 6.230 | 1.825 | | | |
| SPADI Difference 4th to 6thweek | USG | 50 | 3.250 | 0.887 | 1.519 | 94 | 0.132 |
| | LMG | 50 | 2.920 | 1.235 | | | |
| | | | | | | | |




**Graph1:-** ComparisonbetweenUSGguidedandLandmarkguided.




**Graph 2:-** ComparisonbetweenUSGguidedandLandmarkguided.

**ComparisonofSPADIscoresatdifferenttimeperiodsineachgroupseparatelyusingpairedT test – USGgroup-**

1. On comparison of the mean values of SPADI and SPADI 2nd week the meanvalues of SPADI is higher with a difference of 67.583 is statistically significantwitha p value of<0.001.
2. On comparison of the mean values of SPADI and SPADI 4th week the meanvalues of SPADI is higher with a difference of 71.667 is statistically significantwitha p value of<0.001.
3. On comparison of the mean values of SPADI and SPADI 6th week the meanvalues of SPADI is higher with a difference of 74.917 is statistically significantwitha p value of<0.001.
4. On comparison of the mean values of SPADI 2nd week and SPADI 4th week themeanvaluesofSPADI2ndweekishigherwithadifferenceof4.083isstatisticallysignificant with ap value of<0.001.
5. On comparison of the mean values of SPADI 2nd week and SPADI 6th week themeanvaluesofSPADI2ndweekishigherwithadifferenceof7.333isstatisticallysignificant with ap value of<0.001.
6. On comparison of the mean values of SPADI 4th week and SPADI 6th week themean values of SPADI 4th week is higher with a difference of 3.25 is statisticallysignificantwith ap valueof<0.001.

**Landmark guided group-**

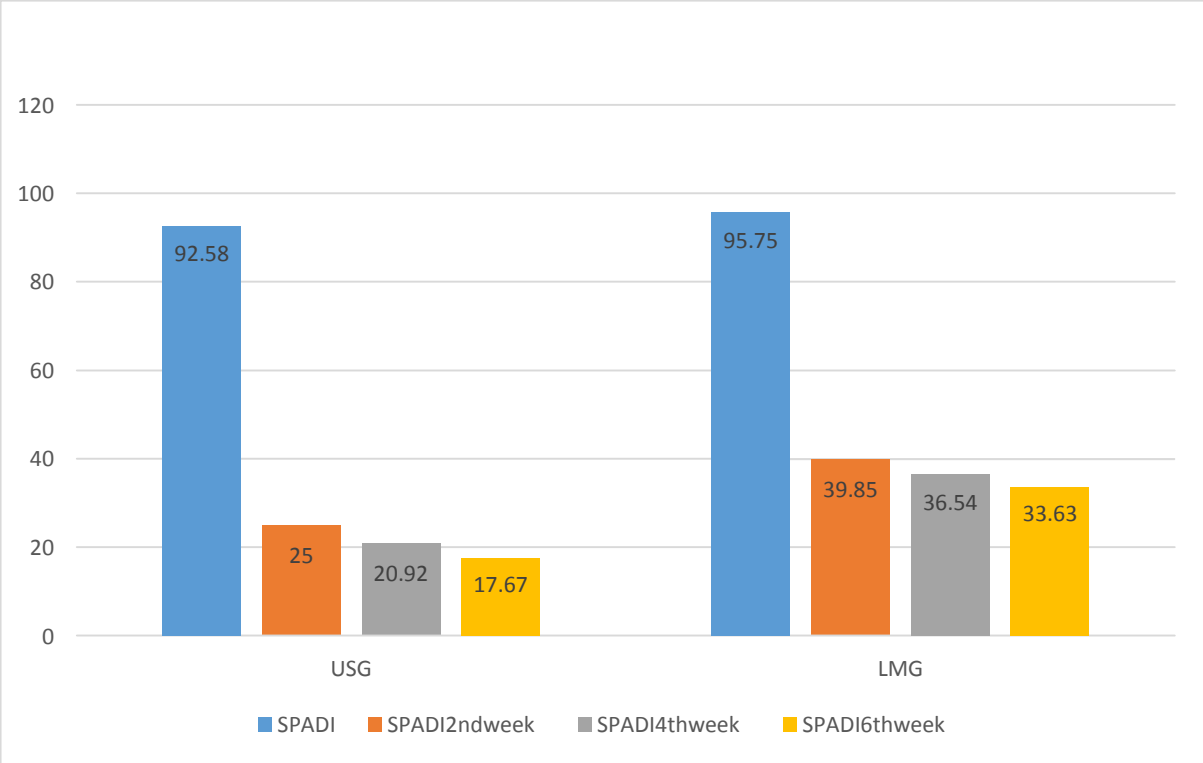
1. OncomparisonofthemeanvaluesofSPADIandSPADI2ndweekthemeanvaluesofSPADIishigherwithadifferenceof55.896isstatisticallysignificantwitha p value of<0.001.
2. On comparison of the mean values of SPADI and SPADI 4th week the mean valuesof SPADI is higher with a difference of 59.208 is statistically significant with a pvalueof<0.001.
3. On comparison of the mean values of SPADI and SPADI 6th week the mean valuesof SPADI is higher with a difference of 62.125 is statistically significant with a pvalueof<0.001.
4. On comparison of the mean values of SPADI 2nd week and SPADI 4th week themean values of SPADI 2nd week is higher with a difference of 3.313 is statisticallysignificantwith ap valueof<0.001.

5. On comparison of the mean values of SPADI 2nd week and SPADI 6th week themean values of SPADI 2nd week is higher with a difference of 6.229 is statisticallysignificantwith ap valueof<0.001.
6. On comparison of the mean values of SPADI 4th week and SPADI 6th week themean values of SPADI 4th week is higher with a difference of 2.917 is statisticallysignificantwith ap valueof<0.001.

**Table 2:-**ComparisonbetweenUSGguidedandLandmarkguidedat2nd,4thand6thweek.

| | | | **N** | **Mean±SD** | **Meandifference ±SD** | **t** | **PVALUE** |
|---|---|---|---|---|---|---|---|
| USG | Pair1 | SPADI | 50 | 92.58±14.54 | 67.58±14.19 | 33.01 | **<0.001** |
| | | SPADI2nd week | 50 | 25±5.36 | | | |
| | Pair2 | SPADI | 50 | 92.58±14.54 | 71.67±13.59 | 36.54 | **<0.001** |
| | | SPADI4th week | 50 | 20.92±4.38 | | | |
| | Pair3 | SPADI | 50 | 92.58±14.54 | 74.92±13.51 | 38.42 | **<0.001** |
| | | SPADI6th week | 50 | 17.67±4.24 | | | |
| | Pair4 | SPADI2nd week | 50 | 25±5.36 | 4.08±2.16 | 13.09 | **<0.001** |
| | | SPADI4th week | 50 | 20.92±4.38 | | | |
| | Pair5 | SPADI2nd week | 50 | 25±5.36 | 7.33±2.42 | 21.02 | **<0.001** |
| | | SPADI6th week | 50 | 17.67±4.24 | | | |
| | Pair6 | SPADI4th week | 50 | 20.92±4.38 | 3.25±0.89 | 25.38 | **<0.001** |
| | | SPADI6th week | 50 | 17.67±4.24 | | | |
| LMG | Pair1 | SPADI | 50 | 95.75±6.46 | 55.9±8.79 | 44.07 | **<0.001** |
| | | SPADI2nd week | 50 | 39.85±4.42 | | | |
| | Pair2 | SPADI | 50 | 95.75±6.46 | 59.21±8.53 | 48.09 | **<0.001** |
| | | SPADI4th week | 50 | 36.54±4.18 | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Pair3 | SPADI | 50 | 95.75±6.46 | 62.13±8.58 | 50.17 | **<0.001** |
| | | SPADI6th week | 50 | 33.63±4.26 | | | |
| | Pair4 | SPADI2nd week | 50 | 39.85±4.42 | 3.31±1.01 | 22.64 | **<0.001** |
| | | SPADI4th week | 50 | 36.54±4.18 | | | |
| | Pair5 | SPADI2nd week | 50 | 39.85±4.42 | 6.23±1.83 | 23.65 | **<0.001** |
| | | SPADI6th week | 50 | 33.63±4.26 | | | |
| | Pair6 | SPADI4th week | 50 | 36.54±4.18 | 2.92±1.24 | 16.36 | **<0.001** |
| | | SPADI6th week | 50 | 33.63±4.26 | | | |




**Graph 3:-** Comparison between USG guided and Landmark guided at 2nd , 4th and 6th weeks

**Sideofshoulderinvolved-**
52 percent patients had their right shoulder affected and 48 percent had a left shoulder impingement.

## Discussion:-

Subacromial impingement syndrome (SAIS) is the most common pathology affecting the shoulder joint.Subacromial impingement syndrome and associated rotator cuff tendinitis are common shoulder problems with the symptoms of pain and loss of motion(8). The classically accepted underlying pathologies causing these symptoms are oedema, haemorrhage, fibrosis, tendinitis and partial or complete ruptures of the rotator cuff tendons at different stages of the syndrome(9). Narrowing of the subacromialspace in SAIS causes encroachment of the subacromial tissue.Mechanismsofrotatorcufftendinopathyhavebeenclassicallydescribedasextrinsic, intrinsic or a combination of both. Intrinsic impingement includes partial or fullthickness tendon tears as a result of the degenerative process that occurs over time withoveruse, tension overload, or trauma of the tendons. Extrinsic Impingement results frombursal

sided RC tendon compression due to narrowing of the subacromial space includeanatomicalfactors and biomechanical factors.

The most common cause of anterior shoulder pain is SAIS(10).The mainconsequences of SAIS are pain and functional loss. A typical pain localized to theanterolateralacromionandmost commonly radiatingtothelateralmid-humerus.Patientsusually complain of pain at night, exacerbated by lying on the involved shoulder orsleeping with the arm overhead. Normal daily activities such as combing one's hair orreaching up into a cupboard become painful. Clinically Neer'ssign,Hawkins sign and Neer's injection test are useful diagnostic tests. Imaging techniques includes X-ray, USG,CT scan and MRI are used for the diagnosis.

A wide range of treatment modalities exists including - electrotherapy, physiotherapy, drugtreatment, local injection of steroid and injection of PRP. The most common treatment isoralNSAIDS,physiotherapyandlocalinjectionofsteroidintothesubacromialspace.

Therapeutic benefits of corticosteroid injection in impingementare due to anti inflammatoryactivity,relaxation of reflex muscle spasm, pain relief andmechanicalimprovement (11) by binding to the cytoplasmic glucocorticoid receptors ,which make localinjectionsofglucocorticoids an easy option inthemanagementofshoulderimpingementsyndrome(12).

Orthopaedicians using the blind technique can never be sure about the depth of insertedneedle(10).Also the accuracy of LMG injection is poor in obese patients. Poor response to blind injection or side effects may be due to a misplaced injection. Potential side effects are septic arthritis, necrotizing fasciitis, a deleterious effect on intraarticular cartilage, or tendon degeneration, which may lead to late rupture of the rotator cuff and subcutaneous atrophy(13). The key of the technique lies inthat the needle tip should be accurately placed into the subacromial bursa to achieve theideal clinical outcome.

Musculoskeletal ultrasound has become very common because of superior technologyand better resolution.Ultrasound is a safe, effective imaging tool toguide musculoskeletal injections into the intended anatomical space as it allows accurate localization of the various target structures (16). Ultrasound ensures correct placement of the needle and delivery of the drug. USG provides fast and lessinvasiverealtimemonitoringduringneedleplacementwithzeroriskofradiationexposure(10).Inaddition, it helps in dynamicanalysisof musculoskeletal system can be performed with USG. Ultrasound scanning to visualise the location of the steroid depositwhichappearsasechogenicfoci or lines,withorwithoutacousticshadowing can be done immediately after the injection which helps to confirm the accurate location of steroid administration[(14)].

A total of 100 patients with shoulder impingement syndrome were included in the study.Patientwerecategorisedbysystematicsamplingintoultrasoundguidedsubacromialsteroid injection group and landmark guided subacromial steroid injection group. Amongthe 100 patients, 50 patients underwent ultrasound guided subacromial steroid injectionand 50 patients underwent landmark guided subacromial steroid injection. Patients werefollowed post treatment on OPD basis at intervals of 2 weeks, 4 weeks and 6 weeks.DuringeachvisitpatientswereevaluatedusingSPADI(shoulderpainanddisabilityindex)score.Ourresultsshowedtha tpatientswhoreceivedultrasound-guidedsubacromial steroid injection had significantly better improvement in function outcomewhencomparedtolandmarkguidedsubacromialsteroidinjectionwithapvalueof <0.001.

A study by Abdel- Rahman et al[(12)] comprising of 514patients with shoulder impingement,259 patients underwent ultrasound guided subacromial steroid injection group and 255patients underwent landmark guided subacromial steroid injection group. Patients withultrasound guided corticosteroid injection had statistically significant improvements inefficacy compared to blind injection group with p value <0.0001. The results of this studyiscommensurate with the results of ourstudy.

A study by William sage et al [(13)]included 307 patients with shoulder impingement,165 patients underwent ultrasound guided subacromial steroid injection group and 142patients underwent landmark guided subacromial steroid injection group. Patients withultrasound guided corticosteroid injection had statistically significant improvements inpain compared to blind injection group after 6 weeks (P<0.03). The rationale for use ofUSGguidedsteroidinjectionistoimprovetheaccuracyofinjection,whichcouldenhancethe functional outcome. Thiswas found to beconsistentwithourstudy.

A study by Ucuncu et al [14] comprising of 60 patients out of which 30 underwent ultrasound guided and 30 patients underwent landmark guided steroid injections. Six weeks after injection, the VAS and the Constant score showed a significantly better improvement in USG group compared with LMG group (mean VAS score decrease: 4.0+/-1.7 for USG vs. 2.2+/-0.9 for LMG, P<0.05; mean Constant score change: 32.2 for USG vs. 12.2 for LMG, P<0.05). Significant improvements were observed in active and passive ROM values in both groups, USG group values being better. Results indicated that the injection of corticosteroids to patients with shoulder pain due to soft tissue disorders under the USG-guidance may improve therapeutic effectiveness and reduce adverse effects.

In a study by Tao Wu Dr [15] et al with total of 445 patients in a randomised controlled studyfoundUSGguidedsteroidinjectionmoreeffectivethanlandmarkguidedsteroidinjectionwhich was foundto be statisticallysignificant with p value<0.04.

A study by PascalZuffereyetal[16] comprising of64 patients with shoulder impingement,32 patients underwentultrasoundguided subacromial steroid injection groupand 32patients underwent landmark guided subacromial steroid injection group. Patients withultrasound guided corticosteroid injection had statistically significant reduction in whencompared to blind injection group with p value <0.005.USG guided steroid injection wereparticularly relevant in reduction of night pain3. Pain reduction was accompanied withimprovementoffunction[3]. This was found to bestatisticallysignificant with ourstudy.

In2004,Naerdoetal[17]studied41patientswithpainfulshoulder.Patientswererandomized to receive a blind subacromial injection (n = 20) and sonographic guidedinjection (n = 21). Six weeks after injection, SFA (Shoulder function assessment) scoreshowedasignificantlygreaterimprovementinsonographicguidedinjectiongroupcompared with blind group,p<0.001.

**Patients lost to follow up were called up to evaluate their SPADI scores.**
Limitations of the study is diagnosis of shoulder impingement syndrome, patients consent, follow up after every 2 weeks.

## Conclusion:-

In this study, we have seen that Ultrasoundguidedsubacromialsteroidinjectionshowsstatisticallysignificantoutcomein pain and improvement of shoulder function when compared with landmark guidedsubacromialsteroidinjection, Thereforefunctionaloutcomeofultrasoundguidedsubacromialsteroidinjectionisbetterthanlandmarkguidedsubacromials teroidinjection.Thus, any patient with shoulder impingement syndrome should directly be advised Ultra sound guided steroid injection to get a better outcome and prevent recurrence.

**Figure1:-** X-rayofshoulderimpingement.

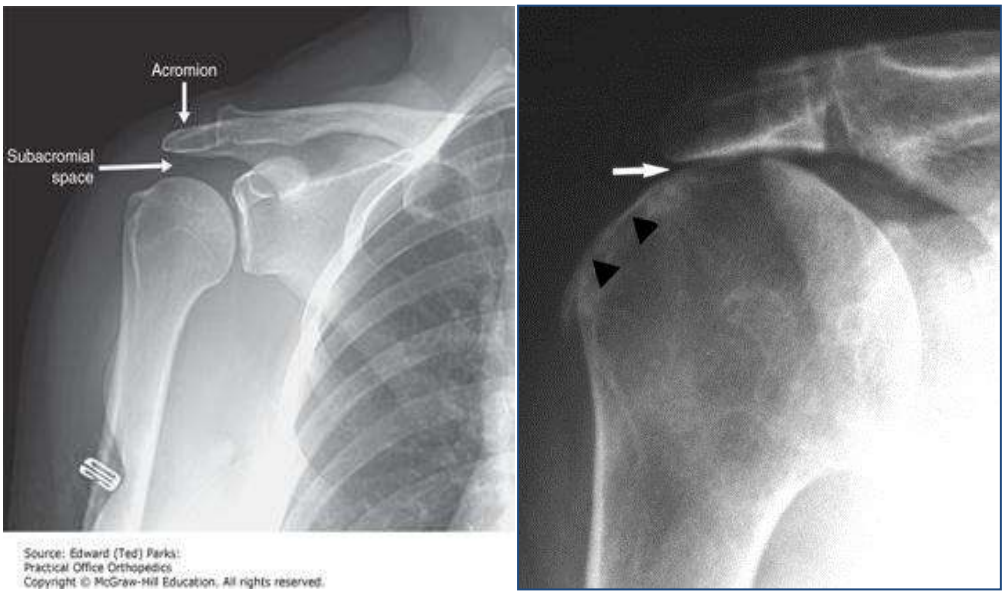


**Fig 2:-** Landmark guided steroid injection.

**Fig 3:-** USGguidedsubacromialsteroid injection.

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