ISKSAA GLOBAL SUMMIT 2016

10th International Congress of ISKSAA

International Society for Knowledge for Surgeons on Arthroscopy and Arthroplasty

Preconference Cadaveric Workshops: 20th November 2016, Delhi / NCR

Conference: 21st - 23rd November 2016, The Leela Hotel & Residences, Gurgaon, Delhi/NCR

ISKSAA SECRETARIAT
Dr Pushpinder Bajaj
ISKSAA PRESIDENT
B-7/5, SAFDARJUNG ENCLAVE, NEW DELHI -110029, INDIA
TEL : +91-11-41057555 / 41057556 / 41057557 MOBILE : +91-9811056525
EMAIL : isksaapresident@gmail.com
www.isksaa.com/isksaa2016

JAJS VOLUME 3 NUMBER 1 JANUARY–APRIL 2016 PAGES 1–42 ELSEVIER

ELSEVIER

Journal of Arthroscopy AND Joint Surgery

JAJS

Official Journal of the International Society for Knowledge for Surgeons on Arthroscopy and Arthroplasty (ISKSAA)

Indexed in Scopus

Volume 3 Number 1 January–April 2016

ISSN: 2214-9635

Available online at www.sciencedirect.com

ScienceDirect

ISKSAA International Society for Knowledge for Surgeons on Arthroscopy and Arthroplasty

ISKSAA (**I**nternational **S**ociety for **K**nowledge for **S**urgeons on **A**rthroscopy and **A**rthroplasty) is a society of orthopaedic surgeons from around the world to share and disseminate knowledge, support research and improve patient care in Arthroscopy and Arthroplasty. We are proud to announce that ISKSAA membership has crossed the **1200** mark (India & Overseas) making it the fastest growing Orthopaedic Association in the country in just over 3 years of its inception. With over **190000 hits from over 139 countries** on the website **www.isksaa.com** & more and more interested people joining as members of ISKSAA, we do hope that ISKSAA will stand out as a major body to provide opportunities to our younger colleagues in training, education and fellowships.

Our Goals.....

- To provide health care education opportunities for increasing cognitive and psycho-motor skills in Arthroscopy and Arthroplasty
- To provide CME programs for the ISKSAA members as well as other qualified professionals.
- To provide Clinical Fellowships in Arthroscopy and Arthroplasty
- To provide opportunities to organise and collaborate research projects
- To provide a versatile website for dissemination of knowledge

ISKSAA Life Membership

The membership is open to Orthopaedic Surgeons, Postgraduate Orthopaedic students and Allied medical personal interested in Arthroscopy & Arthroplasty.

Benefits of ISKSAA Life membership include....

- Eligibility to apply for **ISKSAA's Prestigious Fellowship Programme**. We are finalising affiliations with ESSKA , ISAKOS , BOA , BASK , Wrightington and FLINDERS MEDICAL CENTRE , IMRI AUSTRALIA to provide more **ISKSAA Fellowships** in India , UK , USA , Australia and Europe . **We awarded 14 ISKSAA Fellowships in Feb 2013, 6 ISKSAA IMRI fellowships in Feb 2014, 54 ISKSAA fellowships in September 2014, 22 ISKSAA Wrightington MCh. fellowships in December 2014 and 40 ISKSAA Fellowships in October 2015 and are awaiting the results of ISKSAA Wrightington MCh. fellowships in December 2015.**
- **Free Subscription** of ISKSAA's official, SCOPUS INDEXED, peer reviewed, online scientific journal **Journal of Arthroscopy and Joint Surgery (JAJS).**
- Only as a life member, you can enjoy the benefit of **reduced Congress charges** in **ISKSAA Global Summit 2016 and participate in the Cadaveric workshops.**
- **Member's only section** on the website which has access to the conference proceedings and live surgeries of ISKSAA 2012 , 2013 & 2014 along with a host of other educational material .
- Important opportunity for interaction with world leaders in Arthroscopy & Arthroplasty.
- Opportunity to participate in ISKSAA courses and workshops

To enjoy all the benefits & privileges of an ISKSAA member, you are invited to apply for the Life membership of ISKSAA by going to the membership registration section of the website and entering all your details electronically. All details regarding membership application and payment options are available (www.isksaa.com)

ISKSAA GLOBAL SUMMIT 2016 FELLOWSHIPS

We are happy to announce **over 50 Clinical Fellowships** for ISKSAA 2016 Congress ranging from 2 weeks to 1 month in India and Abroad (UK, USA, Australia & Europe) only for ISKSAA Life members. Applications for Fellowships will open at www.isksaa.com from **1st July 2016** and will close on **31st August 2016**. These fellowships will be focussed on Arthroscopy & Arthroplasty and Sports Medicine. Members with Submission or publication of an article in JAJS, completed an ISKSAA Indian Fellowship & earlier membership of ISKSAA will be preferred for the ISKSAA International Fellowships

XYATA LIFESCIENCES LTD.
HONG KONG
www.xyata.hk

XYATA®

XYATA LIFESCIENCES PVT. LTD.
INDIA
www.xyata.in

offers the highly specialized range

FOR OSTEOARTHRITIS MANAGEMENT

Cross Linked

BIOVISC

ORTHO SINGLE PFS

Hyaluronic Acid Inj. 3ml (90mg / 3ml)

Optimum Volume, Sustained Effect

90 High Concentration HA

Cross-Linked

High Molecular Weight

HYNEES®

PFS

Sodium Hyaluronate Inj. 2ml (10mg / ml)

For effective management of osteoarthritis

Non Avian Source

High Molecular Weight

FOR OSTEOPOROSIS MANAGEMENT

Recombinant Human Parathyroid Hormone (1-34)

ELEVOSTEO®

Teriparatide Injection (rDNA origin)

ELEVATING OSTEOGENESIS

Increases Bone Formation

Reduces Risk of Fractures

ZOLVOID®

Zoledronic Acid Infusion 5mg/100ml

The GOLD STANDARD in Osteoporosis Treatment

2013 2014 2015 Once A Year Dose

Effective and Safe

For Comprehensive Mobility Solutions

A WHO - GMP Certified Company

NATIONAL TOLL FREE HELPLINE: 1800 1111 55

An ISO : 9001 - 2008 Certified Company

FREEDOM® KNEE

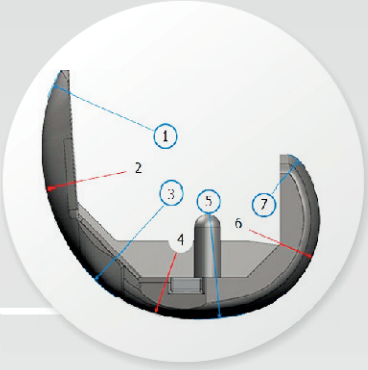
maxx medical

Meril
More to Life

INTRODUCING PATENTED TECHNOLOGIES FOR INDIANS & ASIANS

Asian & Caucasian Size

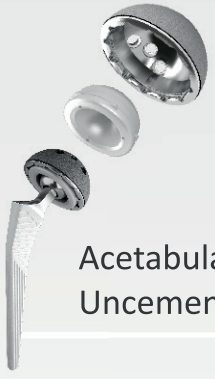
High Flexion Implants



The 7-Radius Patented Femoral design reflects natural anatomy and functional principles

LATITUD™

HIP SYSTEM | Freedom of Choice



Acetabular Cup System & Uncemented Stems

Bi-Polar Cup System & Cemented Stems

A fast growing brand in US and around the globe

Approved by : US FDA | CE European | TGA Australia SFDA
China and Singapore | DCGI,India

Pursue Life™

United States
Maxx Orthopedics Inc. 531 Plymouth Road, Suite 526, Plymouth Meeting, PA 19462, USA. W : www.maxxmed.com

India Sales & Marketing
Meril Life Sciences India Pvt. Ltd. 512, Midas, Sahar Plaza, J.B. Nagar, Andheri East, Mumbai 400 059 Maharashtra. India.
T : +91 22 4047 9797 W : www.merillife.com

Journal of Arthroscopy and Joint Surgery

An official publication of International Society for Knowledge for Surgeons on Arthroscopy and Arthroplasty

(ISSN: 2214–9635)

Volume 3, Number 1, January–April 2016

Aims and Scope

Journal of Arthroscopy and Joint Surgery (JAJS) is committed to bring forth scientific manuscripts in the form of original research articles, current concept reviews, meta-analyses, case reports and letters to the editor. The focus of the Journal is to present wide-ranging, multi-disciplinary perspectives on the problems of the joints that are amenable with Arthroscopy and Arthroplasty. Though Arthroscopy and Arthroplasty entail surgical procedures, the Journal shall not restrict itself to these purely surgical procedures and will also encompass pharmacological, rehabilitative and physical measures that can prevent or postpone the execution of a surgical procedure. The Journal will also publish scientific research related to tissues other than joints that would ultimately have an effect on the joint function.

Author inquiries

You can track your submitted article at http://www.elsevier.com/track-submission. You can track your accepted article at http://www.elsevier.com/trackarticle. You are also welcome to contact Customer Support via http://support.elsevier.com

Subscription information

The *Journal of Arthroscopy and Joint Surgery* (ISSN: **2214-9635**) is published thrice a year. The annual price for **individual subscription** based in India is **INR 3600;** and for international subscribers, the annual price is **USD 60**. For **institutional subscription** within and outside India, please contact the Publishers office at journals.india@elsevier.com.

Further information is available on this journal and other Elsevier products through Elsevier's website (http://www.elsevier.com). Subscriptions are accepted on a prepaid basis only and are entered on a calendar year basis. Issues are sent by standard mail. Priority rates are available upon request. Claims for missing issues should be made within six months of the date of dispatch.

Orders, claims, advertisement and journal enquiries: please contact

Editorial Office: Dr Pushpinder Singh Bajaj, Bajaj Specialist Clinics, B-7/5 Safdarjung Enclave, New Delhi – 110029. Tel: 41057555 / 41057556 / 41057557. Email: psbajaj@hotmail.com.

Publishing Office: Elsevier, A division of Reed Elsevier India Pvt. Ltd., 14th Floor, Building No.10B, DLF Cyber City, Phase-II, Gurgaon-122002, Haryana, India. Email: journals.india@elsevier.com

Journal of Arthroscopy and Joint Surgery

An official publication of International Society for Knowledge for Surgeons on Arthroscopy and Arthroplasty

(ISSN: 2214–9635)

Volume 3, Number 1, January–April 2016

Printed at EIH Limited-Unit Printing Press, IMT Manesar, Gurgaon

Journal of Arthroscopy and Joint Surgery

An official publication of International Society for Knowledge for Surgeons on Arthroscopy and Arthroplasty

(ISSN: 2214–9635)

Volume 3, Number 1, January–April 2016

Table of Contents

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/jajs

Editorial

The current issue of JAJS contains two original papers reporting the outcome of surgical management of acromio-clavicular (A.C) joint injuries by arthroscopic tight rope stabilization. Both the studies are prospective studies and have 10 and 11 patients, respectively. Both the papers have included Rockwood grade III to grade V A.C joint injuries. The similar surgical technique used by both the authors, however, has not produced similar outcomes. The first series of Gupta et al. has reported seven excellent, two good and one fair result. While Gangary et al. in their series have reported one good, seven satisfactory and two poor outcomes. The second study has reported six failures of a total number of 11 shoulders. Two shoulders required revision surgery. Of the six failed cases, four belonged to grade III injury.

Arthroscopic assisted reconstruction with non-rigid coraco-clavicular (CC) lacing is a relatively new method of surgical stabilization of the A.C joint. The main advantages of this method include better cosmetic result, shorter time of surgery, no intra-operative fluoroscopy and reduced post-surgical morbidity due to minimal invasive nature of the surgery.[1,2] However, the method involves a higher cost of the implant and requires a surgeon well versed with the procedure of arthroscopy.[3]

Some of the recent studies have shown successful outcome with coraco-clavicular lacing procedures including tight rope.[1,2,4–6] On the contrary, there are studies which have reported unfavorable results with these surgical procedures. Clavert et al. in a prospective multi-centric study of 116 patients have reported 50% significant persistent dislocations after arthroscopic endobutton coraco-clavicular procedures with a complication rate of 22.4%.[7] Similarly, Barth et al. in a multicenteric study have concluded that coracoclavicular stabilization alone is not sufficient irrespective of the implant used.[8]

Loriaut et al. have also reported 7% patients requiring revision surgery because of persistence of dislocation after arthroscopic assisted reconstruction of A.C. joint.[9]

Thus the results of arthroscopic non-rigid CC fixation, in the current literature are mixed. Whether the diagonally opposite outcomes are related to variations in patient selection or execution of the surgical technique is still unknown.

But a universal similarity in all the studies emanating from single centers is that the series are small with less number of patients thus reducing the power of study. Reporting of larger case series from individual centers will certainly take out the factor of the learning curve of the surgeon, in addition to enhancing the power of the study thus eliminating the chance factor.

REFERENCES

1. Darabos N, Vlahovic I, Gusic N, Darabos A, Bakota B, Miklic D. Is AC TightRope fixation better than Bosworth screw fixation for minimally invasive operative treatment of Rockwood III AC joint injury? *Injury*. 2015;46(suppl 6):S113–S118.
2. Vrgoč G, Japjec M, Jurina P, et al. Operative treatment of acute acromioclavicular dislocations Rockwood III and V-Comparative study between K-wires combined with FiberTape(®) vs. TightRope System(®). *Injury*. 2015;46(suppl. 6):S107–S112.
3. Horst K, Dienstknecht T, Pishnamaz M, Sellei RM, Kobbe P, Pape HC. Operative treatment of acute acromioclavicular joint injuries graded Rockwood III and IV: risks and benefits in tight rope technique vs. k-wire fixation. *Patient Saf Surg*. 2013;7:18.
4. Andreani L, Bonicoli E, Parchi P, Piolanti N, Michele L. Acromio-clavicular repair using two different techniques. *Eur J Orthop Surg Traumatol*. 2014;24(2):237–242.
5. Jensen G, Ellwein A, Voigt C, Katthagen JC, Lill H. Injuries of the acromioclavicular joint: hook plate versus arthroscopy. *Unfallchirurg*. 2015;118(12):1041–1055.
6. Natera-Cisneros L, Sarasquete-Reiriz J, Escolà-Benet A, Rodriguez-Miralles J. Acute high-grade acromioclavicular joint injuries treatment: arthroscopic non-rigid coracoclavicular fixation provides better quality of life outcomes than hook plate ORIF. *Orthop Traumatol Surg Res*. 2016;102(1):31–39.
7. Clavert P, Meyer A, Boyer P, Gastaud O, Barth J, Duparc F. Complication rates and types of failure after arthroscopic acute acromioclavicular dislocation fixation. Prospective multicenter study of 116 cases. *Orthop Traumatol Surg Res*. 2015;101(8 suppl.):S313–S316.
8. Barth J, Duparc F, Andrieu K, et al. Is coracoclavicular stabilisation alone sufficient for the endoscopic treatment of severe acromioclavicular joint dislocation (Rockwood types III, IV, and V)? *Orthop Traumatol Surg Res*. 2015;101(8 suppl.): S297–S303.
9. Loriaut P, Casabianca L, Alkhaili J, et al. Arthroscopic treatment of acute acromioclavicular dislocations using a

double button device: clinical and mri results. *Orthop Traumatol Surg Res*. 2015;101(8):895–901.

Ravi Gupta, MS, DNB, FAMS, FIMSA
Professor, Department of Orthopaedics, Government Medical College Hospital, Chandigarh 160031, India
E-mail address: ravikgupta2000@yahoo.com

Received 7 March 2016
Received in revised form 9 March 2016
Accepted 15 March 2016

http://dx.doi.org/10.1016/S2214-9635(16)30003-7
2214-9635/

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/jajs

Original Article

Humeral avulsion of glenohumeral ligaments – Detection on magnetic resonance arthrography

Rukhtam Saqib [a,*], *Lennard Funk* [b], *Jonathan Harris* [c]

[a] *Foundation Year 2, Stepping Hill Hospital, Stockport, UK*
[b] *Consultant Orthopaedic Surgeon, Wrightington Hospital, UK*
[c] *Consultant Musculoskeletal Radiologist, Salford Royal Hospital, Manchester, UK*

ARTICLE INFO

Article history:
Received 6 December 2015
Accepted 22 February 2016
Available online 22 March 2016

Keywords:
Arthroscopy
Magnetic resonance arthrography
HAGL
Sensitivity
Prevalence

ABSTRACT

Background: Humeral avulsion of the glenohumeral ligaments (HAGL) is an important cause of shoulder instability, with magnetic resonance arthrography (MRA) routinely being used for diagnosis. Our aim was to compare the diagnostic value of MRA to shoulder arthroscopy for the detection of HAGL lesions and to calculate its prevalence.

Methods: Patients who underwent a shoulder arthroscopy with a single surgeon and pre-operative MRA between February 2011 and March 2012 for instability were identified. MRAs were reported by experienced musculoskeletal radiologists and compared to arthroscopy findings for the presence of HAGL lesions. Sensitivity, specificity, positive and negative predictive values, prevalence and positive and negative likelihood ratios were calculated.

Results: A total of 194 patients were identified with a HAGL lesion prevalence of 4.64% on arthroscopy. The sensitivity of MRA in detecting HAGL was 0.44 (CI: 0.14–0.79) and the specificity was 0.97 (CI: 0.94–0.99). The positive predictive value was 0.44 (CI: 0.14–0.79) and negative predictive value was 0.97 (CI: 0.94–0.99). The positive likelihood ratio was 16.44 (CI: 5.30–51.00) and negative likelihood ratio was 0.57 (CI: 0.32–1.02).

Conclusions: MRA appears to be specific and accurate in excluding HAGL lesions, but not sensitive. HAGLs were associated with numerous other injuries such as bankart, SLAP and Hill–Sach lesions. The prevalence of 4.64% is comparable to previous studies.

1. Introduction

Humeral avulsion of glenohumeral ligaments (HAGL) is an important cause of shoulder instability.[1] Instability usually arises as a result of acute trauma from glenohumeral subluxation or dislocation, with a combination of hyperabduction and external rotation.[2] MRA is well established in assessing glenohumeral pathology but its role in identifying HAGL lesions is under-reported in literature.[3] Jana et al. and Carlson described the J-sign referring to the conversion of the U-shaped axillary pouch to a J-shape as the inferior glenohumeral ligament (IGHL) complex drops inferiorly.[3,4] Other characteristics include increased intensity, thickening of the inferior capsule, a

* *Corresponding author*. Tel.: +44 7719491775; fax: +44 7719491775.
E-mail address: rukhtamsaqib@doctors.org.uk (R. Saqib).

http://dx.doi.org/10.1016/j.jajs.2016.02.001

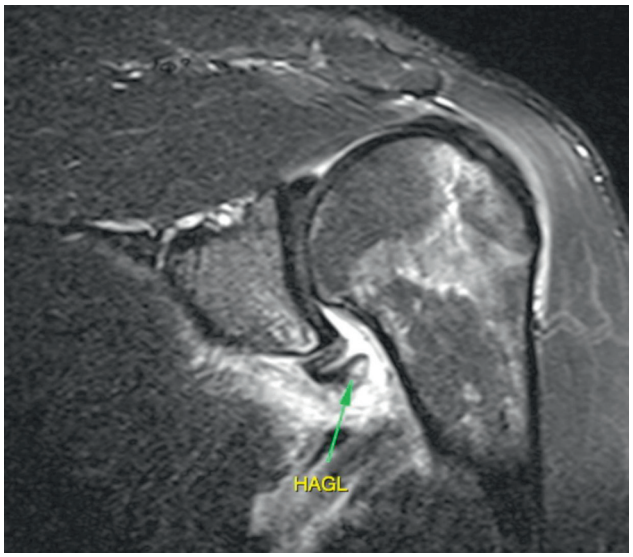


Fig. 1 – A MRA demonstrating a HAGL lesion.

thickened wavy contour and higher intensity within the ligament itself, and extravasation of contrast material along the humeral neck (Fig. 1).[3,4]

Shoulder arthroscopy is the gold standard in detecting HAGL lesions through direct visualisation.[5] The distinguishing sign is visualisation of fibres of the subscapularis through the avulsed inferior joint capsule.[6] Bokor et al. described a disruption of the 'wave' between the reflection of the inferior capsule onto the humeral neck to be a reliable sign of HAGL lesions.[7]

The aim of our study is to assess the diagnostic value of MRA in detecting HAGL lesions compared with arthroscopy and to calculate the prevalence within our study group (Fig. 2).

2. Materials and methods

Shoulder arthroscopies performed by a single Consultant Orthopaedic Surgeon between February 2011 and March 2012 for instability were identified using the surgeon's operative records. All patients attended an initial outpatient clinic and were found to have clinical instability on examination, with suspicion of glenohumeral pathology including the possibility of a HAGL lesion. Of these patients, only those who had a pre-operative MRA were included and identified through PACS (Centricity PACS, GE Healthcare), Bluespier (Bluespier International, Droitwich, UK) and clinic letters. Patients were included regardless of demographics, background, side of operation or indication. The MRAs were requested by the Orthopaedic Surgeon to ensure that radiologists were made aware of the positive clinical findings on the request forms. The investigations and procedures were conducted over three hospital sites. 1.5T MRI scanners with gadolinium as contrast were used throughout with a routine standard protocol of T1 and T1 fat–sat axial, T1 fat–sat coronal and sagittal obliques, T2 fat–sat coronal oblique. All MRAs were reported by experienced specialist musculoskeletal radiologists. Findings were only included as positive when the radiologists or arthroscopist were definitive in their diagnosis.

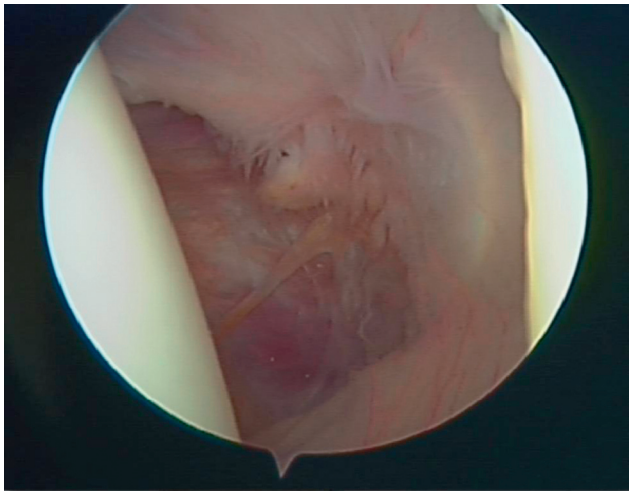


Fig. 2 – A HAGL lesion on shoulder arthroscopy.

2.1. *Statistics*

Sensitivities, specificities, positive and negative predictive values (PPV/NPV), positive and negative likelihood ratios (PLR/NLR) were calculated using Statistical Package for Social Sciences (SPSS) version 22.0 (SPSS Inc. Chicago, IL, USA, 2014).

3. Results

A total of 744 patients underwent shoulder arthroscopic procedures for instability, of which 194 patients had a pre-operative MRA. Patients whose pathology was easily identifiable, or not related to a HAGL, on clinical examination or simpler radiological investigations such as ultrasound and X-rays did not have an MRA. The mean age was 29.9 years with a range between 13 and 69 years. 73%/27% of patients were males/females. Right to left ratio was nearly equal (52%:48%).

The prevalence of HAGL lesions on arthroscopy was 4.64% (9/194 cases). There were 4 true positives, 180 true negatives, 5 false positives and 5 false negatives. The sensitivity and specificity was 0.44 (CI: 0.14–0.79) and 0.97 (CI: 0.94–0. 99) respectively. The PPV was 0.44 (CI: 0.14–0.79) and NPV was 0.97 (CI: 0.94–0. 99). The PLR was 16.44 (CI: 5.30–51.00) and NLR was 0.57 (CI: 0.32–1.02). Table 1 summarises the statistical analysis.

Table 1 – A table to show the sensitivity, specificity, positive likelihood ratios (PLR), negative likelihood ratios (NLR), positive predictive value (PPV) and negative predictive value (NPV) with 95% confidence intervals.

Statistical test	Value	95% confidence intervals
Sensitivity	0.44	0.14–0.79
Specificity	0.97	0.94–0.99
Positive likelihood ratio	16.44	5.30–51.00
Negative likelihood ratio	0.57	0.32–1.02
Positive predictive value	0.44	0.14–0.79
Negative predictive value	0.97	0.94–0.99

Of the 9 confirmed cases of HAGLS on arthroscopy, 8/9 had an associated bankart lesion, 1/9 had an anterior labral periosteal sleeve avulsion (ALPSA), 3/9 had a superior labral tear from anterior to posterior (SLAP), 4/9 had a Hill–Sach's lesion and 2/9 had a rotator cuff tear.

4. Discussion

The diagnostic value of MRA in identifying HAGL lesions has been largely under-reported.[5] Acid et al. compared MRA and multidetector computed tomography (MDCT) to arthroscopy and found that MRA had a sensitivity/specificity of 1.00/0.97 for humeral avulsion of IGHL lesion and 0.58/0.95 for middle glenohumeral ligament tear.[5] Our study showed a lower sensitivity and specificity of 0.44 (CI: 0.14–0.79) and 0.97 (CI: 0.94–0.99) for HAGL lesions. In our study, the presence of any glenohumeral ligament avulsion was considered as a HAGL lesion regardless of position which may account for the differences in statistics. Furthermore, our series was much larger with 194 patients in comparison to 40 patients, which may account for further differences.

Bigliani et al. suggested that avulsion of the IGHL would occur in up to 25% of cases with anterior dislocation in biomechanical cadeveric studies.[8] However, the actual prevalence has been reported to be much less in patients among literature. Wolf et al. were first to demonstrate a prevalence of 9.3% in 64 patients with shoulder instability, of which 73.5% also had a bankart lesion.[6] Yiannakopoulos et al. found that HAGL lesions had a prevalence of 1.57% in 127 patients with anterior shoulder instability.[9] Magee analysed 1000 magnetic resonance imaging (MRI) reports and found a prevalence of 1.6% on MRI and 2.1% in those who proceeded to surgery.[10] Liavaag et al. showed a prevalence of 21.4% of HAGL lesions on MRI in patients with traumatic shoulder dislocation and 7.1% on MRA at follow-up.[11] Bokor et al. found an incidence of 7.5% of HAGL lesions in 514 patients with primary instability on arthroscopy.[7] The incidence of HAGLs rose to 39% in patients who did not have a bankart lesion and violent injury was the cause of the initial dislocation.[7] Bhatia et al. found 11% of patients with bony instability had a HAGL lesion in a 64 patient series.[12] Bui-Mansfield et al. found an incidence of 2% for HAGL lesions in 307 patients who had a diagnostic arthroscopy for glenohumeral instability.[13] Mizuno et al. found a total incidence of 4.6% (14 patients) for HAGLs in 303 shoulders with recurrent dislocations and 4% (12 patients) had an isolated HAGL.[14] The prevalence and population age in our study of 4.64% and mean age 29.9 years is comparable to these studies.

There are several limitations of our study: firstly, a 100% commitment to the diagnosis with terms such as 'possible' and 'cannot exclude' being identified as a negative finding. Time elapsed between the MRA and shoulder arthroscopy could account for worsening or improving pathology and possibly subsequent additional injury leading to the development of a HAGL lesion. MRA reports were available to the arthroscopist prior to the procedure, which may have added an element of bias. However, we tried to minimise this by standardising the method of the procedure to assess the presence of specific glenohumeral pathology regardless of the MRA. Nevertheless, clinical findings were available to both the radiologist and arthroscopist prior to their assessments. Furthermore, arthroscopy, although gold standard, is imperfect due to its operator-dependant nature and may result in overlooked pathology as well.

5. Conclusion

In our study, we found large 95% confidence interval for PPV, PLR/NLR and sensitivity. It is therefore difficult to ascertain definitive conclusions upon diagnostic value with these statistics. Nevertheless, we are able to conclude that MRA is specific and able to predict a negative result with smaller 95% confidence intervals, but it is limited as a diagnostic tool for HAGLs due to its poor ability to produce a definitive positive result. However, by performing a MRA, the shoulder can be examined for concurring pathologies, which may provide an alternative or concurrent diagnosis. A much larger scale study with greater number of cases assessing the diagnostic value of MRA for HAGL lesions is necessary to explore the true potential of MRA. An additional study comparing MRA and MRI would help establish any further benefit, if any, for the more invasive MRA.

Conflicts of interest

All authors have none to declare.

REFERENCES

1. George MS, Khazzam M, Kuhn JE. Humeral avulsion of glenohumeral ligaments. *J Am Acad Orthop Surg*. 2011;19 (March (3)):127–133.
2. Martetschläger F, Ames JB, Millett PJ. HAGL and reverse HAGL lesions. *Shoulder Arthrosc*. 2014;411–418.
3. Jana M, Srivastava DN, Sharma R, et al. Spectrum of magnetic resonance imaging findings in clinical glenohumeral instability. *Indian J Radiol Imaging*. 2011;21 (April–June (2)):98–106.
4. Carlson CL. The J sign. *Radiology*. 2004;232(September (3)):725–726.
5. Acid S, Le Corroller T, Aswad R, Pauly V, Champsaur P. Preoperative imaging of anterior shoulder instability: diagnostic effectiveness of MDCT arthrography and comparison with MR arthrography and arthroscopy. *Am J Roentgenol*. 2012;198:661–667.
6. Wolf EM, Cheng JC, Dickson K. Humeral avulsion of glenohumeral ligaments as a cause of anterior shoulder instability. *Arthroscopy*. 1995;11(October (5)):600–607.
7. Bokor DJ, Conboy VB, Olson C. Anterior instability of the glenohumeral joint with humeral avulsion of the glenohumeral ligament. A review of 41 cases. *J Bone Jt Surg Br*. 1999;81(January (1)):93–96.
8. Bigliani LU, Pollock RG, Soslowsky LJ, Flatow EL, Pawluk RJ, Mow VC. Tensile properties of the inferior glenohumeral ligament. *J Orthop Res*. 1992;10:187–197.
9. Yiannakopoulos CK, Mataragas E, Antonogiannakis E. A comparison of the spectrum of intra-articular lesions in acute and chronic anterior shoulder instability. *Arthroscopy*. 2007;23(September (9)):985–990.

10. Magee T. Prevalence of HAGL lesions and associated abnormalities on shoulder MR examination. *Skelet Radiol*. 2014;43(March (3)):307–313.
11. Liavaag S, Stiris MG, Svenningsen S, Enger M, Pripp AH, Brox JI. Capsular lesions with glenohumeral ligament injuries in patients with primary shoulder dislocation: magnetic resonance imaging and magnetic resonance arthrography evaluation. *Scand J Med Sci Sports*. 2011;21(December (6)): e291–e297.
12. Bhatia DN, DasGupta B. Surgical treatment of significant glenoid bone defects and associated humeral avulsions of glenohumeral ligament (HAGL) lesions in anterior shoulder instability. *Knee Surg Sports Traumatol Arthrosc*. 2013;21(July (7)):1603–1609.
13. Bui-Mansfield LT, Taylor DC, Uhorchak JM, Tenuta JJ. Humeral avulsions of the glenohumeral ligament: imaging features and a review of the literature. *Am J Roentgenol*. 2002;179:649–655.
14. Mizuno N, Yoneda M, Hayashida K, Nakagawa S, Mae T, Izawa K. Recurrent anterior shoulder dislocation caused by a midsubstance complete capsular tear. *J Bone Jt Surg Am*. 2005;87(December (12)):2717–2723.

To read all articles of this issue, you must be a member of ISKSAA.

If you are already a member of

ISKSAA then please login to access the full issue.

To read all articles of this issue, you must be a member of ISKSAA.

If you are already a member of

ISKSAA then please login to access the full issue.

Over Four Centuries of Publishing Experience!

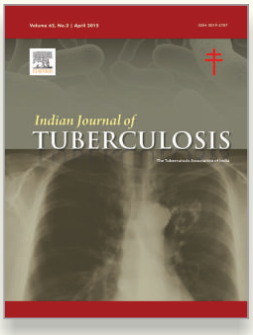
With deep roots in health sciences publishing, Elsevier helps doctors advance practice of medicine by providing world-class information which helps them make critical decisions and improve patient outcomes.

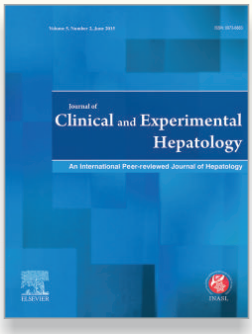
Elsevier brings to you over 2,000 health sciences journals, and works with over 7,000 journal editors, 70,000 editorial board members, 300,000 reviewers and 600,000 authors. As the world's leading publisher of science and health information, Elsevier brings to you knowledge products including:

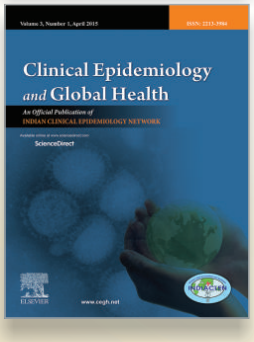
- *The Lancet*
- *The Clinics of North America*
- *Gray's Anatomy*
- *Nelson's Pediatrics*
- *Dorland's Illustrated Medical Dictionary*
- *Netter's Atlas of Human Anatomy*

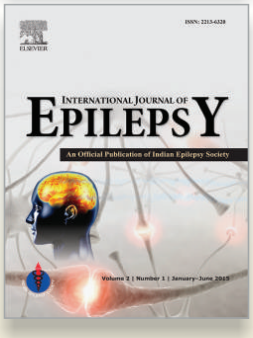
Leading Indian Journals

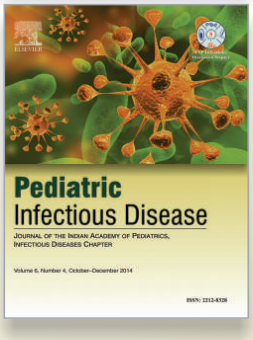
from the House of Elsevier











For advertisement and subscription enquiries in Elsevier journals, please write to **journals.india@elsevier.com**

Over Four Centuries of Publishing Experience!

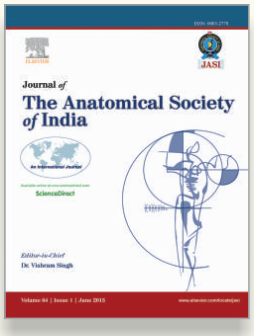
With deep roots in health sciences publishing, Elsevier helps doctors advance practice of medicine by providing world-class information which helps them make critical decisions and improve patient outcomes.

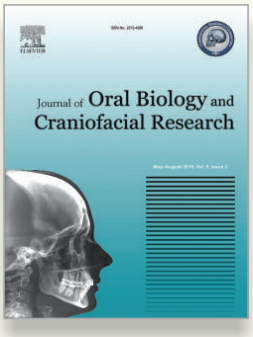
Elsevier brings to you over 2,000 health sciences journals, and works with over 7,000 journal editors, 70,000 editorial board members, 300,000 reviewers and 600,000 authors. As the world's leading publisher of science and health information, Elsevier brings to you knowledge products including:

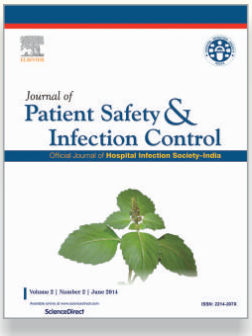
- *The Lancet*
- *The Clinics of North America*
- *Gray's Anatomy*
- *Nelson's Pediatrics*
- *Dorland's Illustrated Medical Dictionary*
- *Netter's Atlas of Human Anatomy*

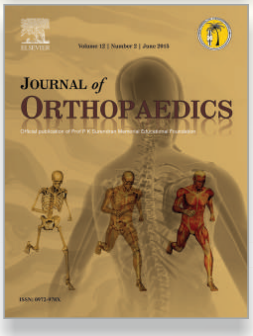
Leading Indian Journals

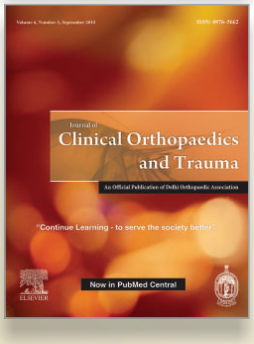
from the House of Elsevier

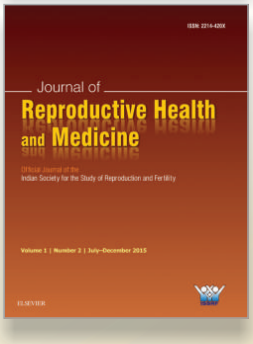












For advertisement and subscription enquiries in Elsevier journals, please write to **journals.india@elsevier.com**

Our Products

IN OSTEOPOROSIS

℞ Cap. SARVACAL™

Calcium Carbonate with Calcitriol
& Zinc Softgel Capsules

The Essential Calcium

In Low Back Pain & Arthritis

℞ Tab. ANKON™ 90 / 120

Etoricoxib 90/120 mg

Lets Your Patient Move ON...

IN VITAMIN D DEFICIENCY

℞ Cap. D-3 ONCE™

(Cholecalciferol 60,000 IU)

The Vitamin That Matter

In Co - ℞ With NSAID

℞ Cap. Rabitrol D™

(Rabeparazole 20 mg + Domperidome 30mg SR)

Helpline : 9582874697

All products are available at 98.4 Chemist Retail Chain