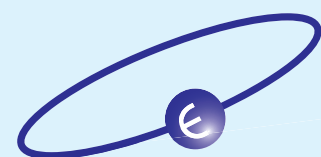


Now disperse away worries of compliance from your patient's life
with a better and faster recovery with



DISPERZYME®

Trypsin B.P. 96mg, Bromelain 180mg, Rutoside Trihydrate B.P. 200mg

Dispersible tablets

The only brand with German Technology

Advanced technology

Each particle is enteric coated thus passes safely through stomach
and gives maximum intestinal absorption and bioavailability



For edema and inflammation in¹

Trauma
Post operative inflammation
Cellulitis
Wound healing

For soft tissue and sport injuries^{2,3}

Reduces pain and inflammation and helps in
faster recovery from

Tendonitis	Spondylopathies	Sprains
Frozen shoulder	Contusions	Bursitis

From pioneers of systemic enzyme therapy in India

Sources:

[1] D.N.Savant, H.K.Parikh, G.V.Daifary, Efficacy and tolerability of phlogenzym in controlling postoperative inflammation in patients undergoing major surgical resection and reconstruction for head and neck malignancies, Prospective randomized, open, phase III clinical trial, Tata memorial hospital, Mumbai 400012 [2] Rhan H. D., Treatment of ankle distortion with Phlogenzym (1992) [3] Baumuller M, The use of hydrolytic enzymes in blunt soft tissue injuries and ankle distortion, General Medicine 19 (1990), 178.



Office:
81/A, Mittal Chambers,
Nariman Point, Mumbai 400 021
Maharashtra.



JOURNAL OF ARTHROSCOPY AND JOINT SURGERY

JAJS

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

Indexed In Scopus & Embase

Volume 6 Number 2 May-August 2019

Available online at www.sciencedirect.com

ScienceDirect

E-ISSN: 2214-9635
P-ISSN: 2542-6001



ISKSAA International Society for Knowledge for Surgeons
on Arthroscopy and Arthroplasty

ISKSAA (International Society for Knowledge for Surgeons on Arthroscopy and Arthroplasty) 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 **1800** mark (India & Overseas) with members from **over 40 countries** making it the **fastest growing Orthopaedic Association in the country & region** in just 6 years of its inception . With over **365000 hits from over 161 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....

- **Free Subscription** of ISKSAA's official , SCOPUS INDEXED , EMBASE INDEXED peer reviewed , online scientific journal **Journal of Arthroscopy and Joint Surgery (JAJS)** .
- Eligibility to apply for **ISKSAA's Prestigious Fellowship Programme**. We have finalised affiliations with ESSKA , ISAKOS , BOA , BASK , BOSTAA , BESS , Edge Hill University at Wrightington and FLINDERS MEDICAL CENTRE , IMRI AUSTRALIA to provide more **ISKSAA Fellowships** in India , UK , USA , Australia and Europe . We have offered over **400 Clinical Fellowships as of date including 54 in ISKSAA 2014 , 40 in ISKSAA 2015 , 63 in ISKSAA 2016 , 55 in ISKSAA 2017 , 20 in ISKSAA 2018 & 100 in ISKSAA 2019 and over 50 ISKSAA Wrightington MCh Fellowships from 2014 to 2018 .**
- We have initiated **ISKSAA JOD & ISKSAA WHA paid fellowship programs** from 2017 for 2 months based in Australia .
- **The current round of 100 ISKSAA fellowships interviews were held in ISKSAA BESS 2019 in March 2-3rd 2019 for 2019 and 2020 at New Delhi along with the ISKSAA Wrightington MCh Fellowships .**
- **The next round of ISKSAA fellowship interviews will be in 2020 .**
- We had offered **60 1 week ISKSAA certified Fellowships** from 11th – 15th June & 25-29th June 2018 for ISKSAA members registered for ISKSAA LEEDS 2018 on a first come first basis .
- Only as a life member , you can enjoy the benefit of **reduced Congress charges** in future ISKSAA Conferences .
- **Member's only section** on the website which has access to the conference proceedings and live surgeries of ISKSAA 2012 , 2013 , 2014 & 2016 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 on the website (www.isksaa.com)

XYATA LIFESCIENCES LTD.
HONG KONG
www.xyata.hk



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

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



Journal of Arthroscopy and Joint Surgery

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

(ISSN: 2542-6001)

Volume 6, Number 2, May–August 2019

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>

Copyright

© 2019, International Society for Knowledge for Surgeons on Arthroscopy and Arthroplasty. Published by Reed Elsevier India Pvt. Ltd. All rights reserved. Papers accepted for publication become the copyright of *International Society for Knowledge for Surgeons on Arthroscopy and Arthroplasty*, and authors will be asked to sign a transfer of copyright form, on receipt of the accepted manuscript by Elsevier. This enables the Publisher to administer copyright on behalf of the Authors, whilst allowing the continued use of the material by the Author for scholarly communication.

This journal and the individual contributions contained in it are protected under copyright by Elsevier Ltd., and the following terms and conditions apply to their use:

Photocopying

Single photocopies of single articles may be made for personal use as allowed by national copyright laws. Permission of the Publisher and payment of a fee is required for all other photocopying, including multiple or systematic copying, copying for advertising or promotional purposes, resale, and all forms of document delivery. Special rates are available for educational institutions that wish to make photocopies for non-profit educational classroom use.

For information on how to seek permission visit <http://www.elsevier.com/permissions> or call: (+44) 1865 843830 (UK) / (+1) 215 239 3804 (USA).

Derivative Works

Subscribers may reproduce table of contents or prepare lists of articles including abstracts for internal circulation within their institutions. Permission of the Publisher is required for resale or distribution outside the institution. Permission of the Publisher is required for all other derivative works, including compilations and translations (please consult www.elsevier.com/permissions).

Electronic Storage or Usage

Permission of the Publisher is required to store or use electronically any material contained in this journal, including any article or part of an article (please consult www.elsevier.com/permissions).

Except as outlined above, no part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior written permission of the Publisher.

Notice

No responsibility is assumed by the Publisher for any injury and/or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instructions or ideas contained in the material herein. Because of rapid advances in the medical sciences, in particular, independent verification of diagnoses and drug dosages should be made.

Although all advertising material is expected to conform to ethical (medical) standards, inclusion in this publication does not constitute a guarantee or endorsement of the quality or value of such product or of the claims made of it by its manufacturer.

Subscription information

The *Journal of Arthroscopy and Joint Surgery* (ISSN: 2542-6001) 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 inquiries: Please visit our Support Hub page <https://service.elsevier.com> for assistance.

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 on Arthroscopy and Arthroplasty

(ISSN: 2542-6001)

Volume 6, Number 2, May–August 2019

Editors-in-Chief

MR SANJEEV ANAND UK

DR AMOL TAMBE UK

PROF HEMANT PANDIT UK

Executive Editors

PROF LALIT MAINI Delhi
PROF RAVI GUPTA Chandigarh

Managing Editor

DR PUSHPINDER BAJAJ Delhi

Deputy Editor

MR KAPIL KUMAR UK

Section Editors

Trauma & Rehabilitation

DR ALEXANDER WOOD UK

Hip

DR AJAY AGGARWAL USA

Foot & Ankle

DR MUNEESEH BHATIA UK

Training & Education

DR JANAK MEHTA Australia

Arthroplasty

DR MANOJ SOOD UK

Pediatric Orthopaedics

DR PARMANAND GUPTA

Orthopaedic Oncology

DR MANISH PARUTHI

Elbow, Wrist & Hand

DR RAJ MURALI UK

Shoulder

DR MANIT ARORA Mohali

Associate Editors

DR DINESH PATEL USA
DR PONKY FIRER South Africa

PROF JEGAN KRISHNAN Australia
DR GURINDER BEDI Delhi

DR RAJESH SETHI UK
DR DINSHAW PARDIWALA Maharashtra

Editorial Board

PROF GIANNOUDIS UK
PROF AMAR RANGAN UK
DR KHALID MOHAMMAD New Zealand
DR MAKARAM SRINIVASAN UK
DR V BHALAIK UK

DR PUNEET MONGA UK
DR TAOFEK ADEYEMI Nigeria
DR M S DHILLON Chandigarh
DR VIVEK PANDEY Karnataka
DR SUNDARARAJAN Tamil Nadu

DR ASHISH DEVGAN Haryana
DR RAJU EASWARAN Delhi
DR RAHUL KHARE Delhi
DR AMITE PANKAJ Delhi

Advisory Board

DR ANDREAS SETTJE Germany
DR ANANT JOSHI Maharashtra
DR ASHOK RAJGOPAL Delhi
DR ASHISH BABULKAR Pune
DR ASIT SHAH USA
DR ANIL BHAT Karnataka
MR BINOD SINGH UK
DR BINU THOMAS Tamil Nadu
DR DAVID MARTIN Australia
DR DAVID RAJAN Tamil Nadu
DR DENNY LIE Singapore
DR EDWARD T MAH Australia
DR GRAHAM MERCER Australia
DR H K WONG Hong Kong

DR HIROYUKI SUGAYA Japan
DR HITESH GOPALAN Karnataka
PROF J E MENDES Portugal
DR JAAP WILLEMS Netherlands
DR JOHN EBNEZAR Karnataka
DR JVS VIDYASAGAR Andhra Pradesh
PROF LENNARD FUNK UK
DR MARIO PENTA Australia
DR NICK WALLWORK Australia
DR NIRBHAY SHAH Gujarat
DR PAOLO PALADINI Italy
DR PARAG SANCHETI Pune
DR PETER CAMPBELL Australia
PROF P P KOTWAL Delhi

PROF RAJASEKARAN Tamil Nadu
MR RAM VENKATESH UK
MR R PANDEY UK
PROF RAJ BAHADUR Chandigarh
MR ROBERT J GREGORY UK
DR ROHIT ARORA Austria
DR SACHIN TAPASVI Pune
DR SANJAY DESAI Maharashtra
DR SANJAY GARUDE Maharashtra
DR SANJAY TRIVEDI Gujarat
DR SRIPATHI RAO Karnataka
PROF SUDHIR KAPOOR Delhi
MR VED GOSWAMI UK
DR YOUNG LAE MOON Korea

Copyright (C) 2019, International Society for Knowledge on Arthroscopy and Arthroplasty. All rights reserved.

Published by Reed Elsevier India Pvt. Ltd.

No part of the publication may be transmitted in any form or by any means, electronic or mechanical, without written permission from the Editor-in-Chief.

Disclaimer: Although all advertising material is expected to conform to ethical (medical) standards, inclusion in the publication does not constitute a guarantee or endorsement of the quality or value of such product or of the claims made of it by its manufacturer. Please consult full prescribing information before issuing prescriptions for any products mentioned in this publication.

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: 2542-6001)

Volume 6, Number 2, May–August 2019

Table of Contents

Editorial

- Decompression surgery under pressure 79
Simond Jagernauth, Patrick Groarke, Peter Brownson

Knee Arthroplasty

- Is there a difference in treatment outcome for monomicrobial and polymicrobial periprosthetic joint infections?
 Systematic review and study quality analysis 82
Jorge Chahla, Mark Cinque, German Garabano, Alan Gessara, Katherine M. Connors, Zachary S. Aman, Hernan del Sel
- Mid to long-term outcomes of the primary constrained condylar knee arthroplasty 88
Susete Carneiro, Alexander Willis, Kamen Kutzarov, David Chalmick
- Functional outcome of single stage bilateral total knee replacement measured using oxford knee score 94
Shriram Krishnamoorthy, A.B. Govindaraj, A.N. Vivek, Sohanlal VijayKumar, M. Anand
- Comparative evaluation of periarticular infiltration of two cocktail regimens for analgesia in post-operative patients of total knee replacement 98
V.K. Gautam, Ajeet Kumar, Munisha Agarwal, Bushu Harna, Rishabh Saini, Siddharth Sharma, Dhananjaya Sabat
- How effective is periarticular drug infiltration in providing pain relief following Total Knee Replacement as compared to epidural analgesia? 103
V.J. Chandy, K. Ajith, V.P. Krishnamoorthy, A.T. Oommen, P. Tyagraj, J. George, T.D. Hariharan, S.P. George, P.M. Poonnoose

Knee Arthroscopy

- Rotational stability after ACL reconstruction using anatomic double bundle technique versus anatomic single bundle technique plus anterolateral ligament augmentation 108
Begad Hesham Abdelrazek, Ahmed Mahmoud Gad, Ahmed Abdel-Aziz
- Tensile strength comparison between hamstring tendon, patellar tendon, quadriceps tendon and peroneus longus tendon: A cadaver research 114
Krisna Y. Phatama, Mohamad Hidayat, Edi Mustamsir, Ananto Satya Pradana, Brian Dhananjaya, Surya Iman Muhammad
- Accuracy of Schottle's point location by palpation and its role in clinical outcome after medial patellofemoral ligament reconstruction 117
Vivek Pandey, Kiran Kumar Mannava, Nivedita Zakhar, Bhavya Mody, Kiran Acharya
- An in vitro study on the effects of various concentrations of low and high molecular weight hyaluronic acid on human chondrocyte cell metabolism 123
G. Jacob, V. Shetty, S.M. Shetty, J. Varughese, R.P. Singh, V. Kadage
- Convenient three portal technique to remove locked bucket handle medial meniscus tear 128
Vikram Arun Mhaskar, Jitendra Maheshwari
- A novel technique for bone debris clearance during anterior cruciate ligament reconstruction 131
D.R.W. MacDonald, E. Bruce, I. Stevenson





ISKSAA International Society for Knowledge for Surgeons
on Arthroscopy and Arthroplasty

Wrightington, Wigan and Leigh **NHS**
NHS Foundation Trust



Edge Hill University



ISKSAA – Wrightington International Training Fellowships leading to MCh degree

We are proud to provide this unique opportunity for post-graduate education and subspecialist training in the UK in partnership with Edge Hill University since 2014 . Around 40 ISKSAA members so far have succeeded in obtaining positions through this program in the UK .

The programme is aimed at motivated candidates who wish to come to UK to obtain 2 years of clinical experience, specialist surgical training and an MCh degree from Wrightington Hospital and Edge Hill University. The next Interview dates will be slated for later this year in 2019 and details will be sent to all ISKSAA members once they are finalized .

Having cleared the IELTS exam before the interviews will be of advantage for final selections . The Clinical posts would start in August 2020 .

For further details ,

You may visit the website at http://isksaa.com/isksaa_Wrightington_MCh_Fellowship.php or you may communicate with ISKSAA President at isksaafellowships@gmail.com.

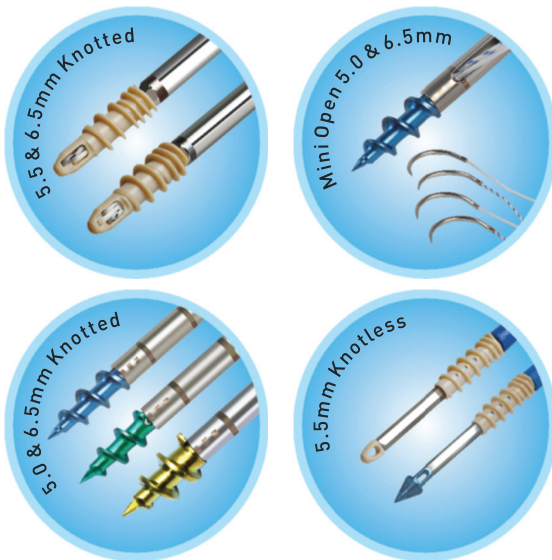


BIOTEK[®]
we put life in metal

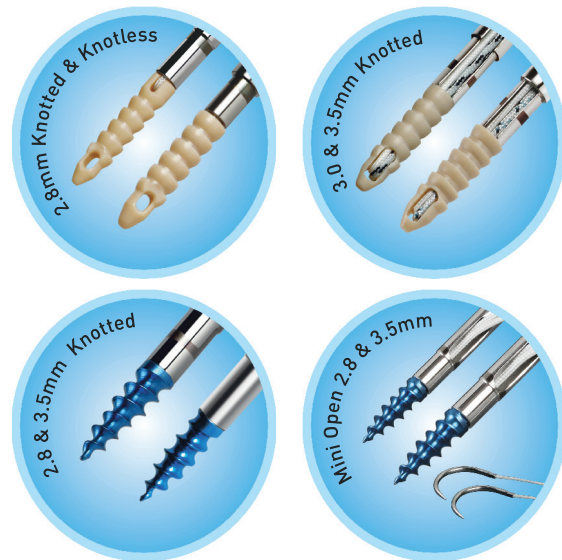
Technology that
touches *life.*

SHOULDER ARTHROSCOPY

Suture Anchors for Rotator Cuff Repair

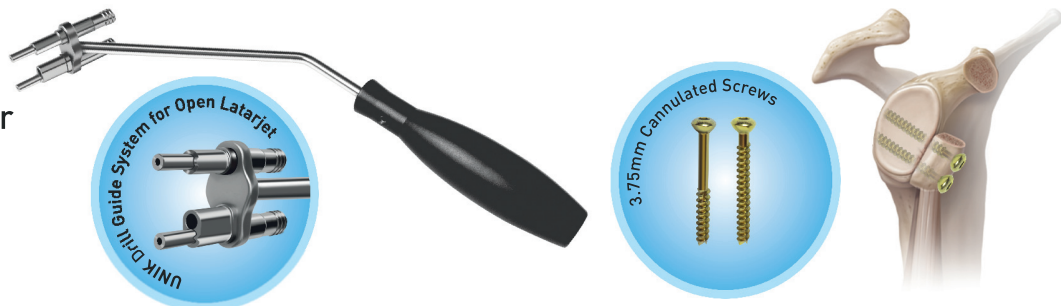


Suture Anchors for Slap & Bankart Repair



OPEN LATARJET

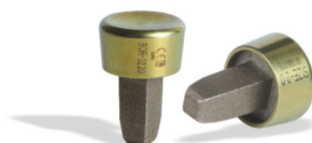
Latarjet / Coracoid Process Transfer



EXTREMITIES



Ursa[®]
Hemi-Shoulder
Arthroplasty System



Oskar[®]
Radial Head Prosthesis



Texx[®]
Total Elbow
Arthroplasty System

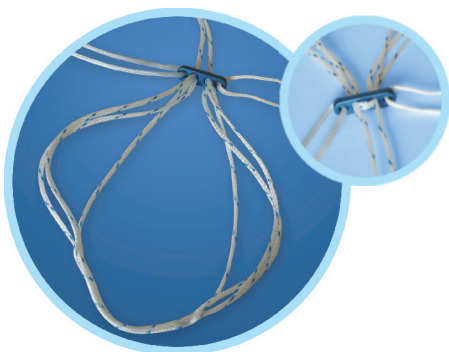


Technology that
touches *life.*

KNEE ARTHROSCOPY

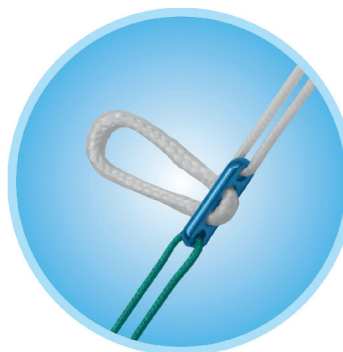
Buttonfix

Adjustable Loop Device



Onbutton CL

Closed Loop Device



Offering two of the strongest soft tissue suspensory fixation devices for Cruciate Reconstruction.

Softfix-PK

Interference Screws
(PEEK)



Softfix

Interference Screws
(Titanium)

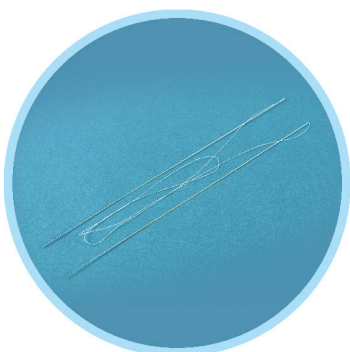


Osteotwin

Bio Composite Interference
Screws



Meniscus Repair (Inside-Out)



Biddu HTO

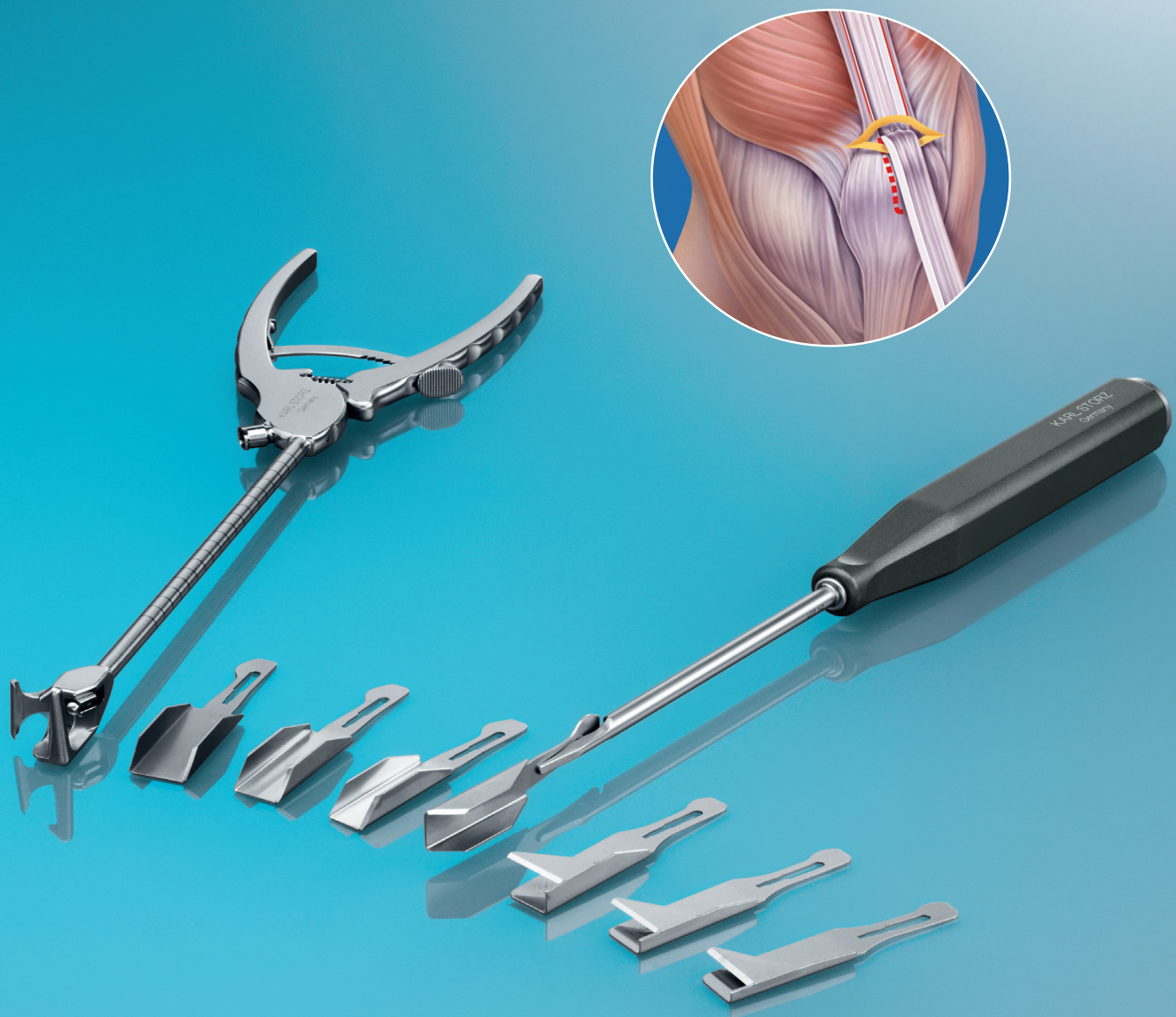


Above all the products are CE Certified and Indian FDA.



BIOTEK - Chetan Meditech Pvt. Ltd.

Opp. V. S. Hospital, Ellisbridge, Ahmedabad 380 006. Gujarat, INDIA.
Phone: +91 79 2657 8092, 40098394, 79 2657 7639
Email: info@biotekortho.com Website: www.biotekortho.com



961570-43 ART 68 3.0.03/2015/P-E

QuadCut

Minimally Invasive Quadriceps Tendon Harvesting

www.karlstorz.com

STORZ
KARL STORZ — ENDOSKOPE
THE DIAMOND STANDARD



Improve your ability to establish, execute and evaluate institutional research strategy

Elsevier's Research Intelligence solutions provides answers to the most pressing challenges that research administrators face. Our suite of innovative software solutions improves your ability to establish, execute and evaluate research strategy and performance.

Scopus

Track, analyze and visualize global research with our abstract and citation database of peer-reviewed literature, including scientific journals, books and conference proceedings covering the fields of science, technology, medicine, social sciences and arts and humanities.

SciVal

Visualize your institution's research performance, benchmark relative to peers, develop collaborative partnerships and explore research trends.

Mendeley

Organize your research, collaborate and connect with others online, and discover the latest research with our free reference manager and academic social network. Mendeley Institutional Edition includes premium user features and competency for researchers and librarians.

Pure

Develop reports on research output, carry out performance assessments, and showcase your researchers' expertise, all while reducing administrative burden for researchers, faculty and staff.

For a FREE custom report on your institution's research strengths, visit: elsevier.com/research-intelligence/ace





Decompression surgery under pressure

Keywords:

Subacromial impingement
Subacromial decompression
CSAW
FIMPACT

1. Introduction

Painful shoulders pose a substantial economic burden¹ accounting for 2–4% of primary care consultations in the UK² and 4.5 million visits to physicians annually in the USA.³

Neer⁴ described the subacromial impingement syndrome as a potential cause of subacromial pain. The mechanism proposed involved mechanical contact between the rotator cuff tendons and the extrinsic overlying acromion or bone spur that often forms at the anteroinferior margin of the acromion, narrowing the subacromial space.

Whilst subacromial pain accounts for up to 70% of all shoulder pain problems⁵ it is important to realise that such pain may be caused by a spectrum of shoulder pathology including subacromial impingement but also rotator cuff tears and calcific tendinitis. In addition, subacromial impingement is commonly associated with other pathologies including biceps tendonitis and acromioclavicular joint arthritis.

1.1. This editorial focusses on isolated subacromial impingement

There have been a number of studies published which advocate the use of physiotherapy in the treatment of subacromial impingement. A study by Hallgren et al.⁶ published in 2014 in the British Journal of Sports Medicine showed an improvement in patients treated by a three month exercise specific programme. Only 20% of patients treated by exercise went on to surgery compared to 63% in the control group. Similarly, in 2013 Ketola et al.⁷ published a randomised control trial comparing an exercise programme to subacromial decompression (in conjunction with the exercise programme). In their study of 109 patients, at 5-year follow up, no significant difference could be found between the two groups.

In contrast, other studies have indicated an improved outcome following subacromial decompression surgery over therapy. In 2018, Farfaras et al.⁸ published a prospective randomised trial with a ten year follow up period which showed significantly better outcomes in patients treated by open and arthroscopic subacromial

decompression over physiotherapy alone.

Whilst there is no doubt that many patients with isolated subacromial impingement will respond to non operative treatment alone,⁹ surgical intervention is often used in the treatment of recalcitrant cases.

In 2015, the British Elbow and Shoulder Society published a patient care pathway for the management of subacromial shoulder pain.¹⁰ This care pathway formed the basis of the commissioning guidelines which were NICE approved.¹¹

The commissioning guidelines for the management of rotator cuff tendinopathy/subacromial impingement suggest the following measures should be considered in the initial treatment of this condition:

- Education, rest, NSAIDs, simple analgesia
- Appropriate structured physiotherapy with goal setting for 6 weeks to include postural correction and motor control retraining, stretching, strengthening of the rotator cuff and scapula muscles and manual therapy
- Do not consider further physiotherapy unless there is improvement during the first 6 weeks of treatment
- Injection of corticosteroid into the subacromial space. Normally, only one injection should be considered as repeated injections may cause tendon damage
- A second injection is occasionally appropriate after 6 weeks, but should only be administered in patients who received good initial benefit from their first injection and who need further pain relief to facilitate their structured physiotherapy treatment

The guidelines further recommend arthroscopic shoulder decompression (acromioplasty) should be considered for patients with:

- Impingement pain in the absence of a rotator cuff tear
- Impingement pain with an irreparable rotator cuff tear
- Impingement pain with a cuff tear that the patient chooses not to have repaired
- Failure of appropriate conservative management

The guidelines advise that a shared decision making model should be adopted, defining treatment goals and taking into account personal circumstances.

Historically it has been considered that the mechanism by which decompression surgery is effective is by increasing the subacromial space, hence preventing extrinsic impingement of the rotator cuff tendons by the overlying acromion process.⁴ This is done by excising the anterior bony acromial spur, flattening the undersurface of the acromion and excising the overlying bursal tissue

(bursectomy). However it should be noted that this mechanism has been brought in to question in the light of recent research.

In 2009, a RCT performed by Henkus et al.¹² compared subacromial decompression (acromial resection) plus bursectomy with bursectomy alone and reported no significant difference in clinical outcome between the groups.

Recently, the Can Shoulder Arthroscopy Work (CSAW) study¹³ was published in the Lancet. This trial focused specifically on subacromial decompression in isolation and aimed to investigate whether the proposed critical surgical element, removal of bone and soft tissue, is necessary.

All of the patients in the study were suffering from subacromial impingement pain and had had symptoms for a minimum duration of three months. All patients had an intact rotator cuff or partial thickness tendon tear and had failed to respond to physiotherapy treatment and at least one cortisone injection.

The trial randomised patients to three treatment options:

- i. Arthroscopic surgery with surgical decompression
- ii. Arthroscopy without surgical decompression (placebo surgery)
- iii. No surgery and observation only.

The results of the trial were as follows:

- i. There was no difference between arthroscopic subacromial decompression and arthroscopy only (placebo surgery)
- ii. Patients improved without further treatment and with observation only
- iii. Surgery (both decompression and placebo) conveyed a small, statistically significant improvement compared to observation only but this was not considered to be clinically relevant.
- iv. The trial concluded that the difference between the surgical routes and no treatment might be the result of a placebo effect or postoperative physiotherapy

When published, the trial raised significant media interest and unsurprisingly, the economic benefit of subacromial decompression surgery was immediately brought into question.

In response to the study, a joint statement was issued by the British Elbow and Shoulder Society, British Orthopaedic Association and the CSAW study group.¹⁴ The statement noted that the trial had shown the mechanism by which subacromial decompression surgery provided improvement was uncertain and had demonstrated that some patients can improve without surgery. Furthermore, it highlighted the importance of involving patients in a decision making process and of applying appropriate commissioning guidelines.

There is published evidence that treating patients according to national guidelines is associated with improved outcomes. In 2017 Jacobsen et al.¹⁵ evaluated arthroscopic subacromial decompression in 244 patients selected according to national guidelines. The guidelines stated that pain must have been present for longer than 6 months and a physiotherapy programme (non-specific) must have been undertaken for a minimum of 3 months before decompression surgery was considered. Patients treated on this basis demonstrated significant clinical improvements following decompression at 6 month follow up. The authors concluded that arthroscopic subacromial decompression was a valid treatment, reducing pain and improving quality of life for patients selected for surgery according to the Danish national guidelines.

Shortly after publication of the CSAW study, a similar study was published, in the BMJ – the Finnish Shoulder Impingement Arthroscopy Control Trial (FIMPACT).¹⁶ The aim of this study was to assess the efficacy of arthroscopic subacromial decompression, comparing it with a placebo surgical intervention (diagnostic arthroscopy) and

with a non-operative alternative, exercise therapy, in a more pragmatic setting. It was a multicentre three group randomised double-blind, sham control trial. There were 210 participants with symptoms consistent with shoulder impingement syndrome for more than 3 months that had failed to improve with conventional conservative treatment.

In the primary intention to treat analysis (arthroscopic subacromial decompression versus diagnostic arthroscopy) no clinically relevant between-group differences were seen in the Visual Analogue Scale (VAS) scores at arm rest or on arm activity at 24 months. In the secondary comparison (arthroscopic subacromial decompression versus exercise therapy), statistically significant differences were found in favour of arthroscopic subacromial decompression in both VAS at rest and on arm activity at 24 months but the mean differences between groups did not exceed the prespecified minimal clinically important difference (MCID).

The FIMPACT authors argue that diagnostic arthroscopy can be perceived as a placebo intervention as tidal irrigation and arthroscopic lavage have both failed to provide a benefit over placebo procedures in knee osteoarthritis.^{17,18} One could argue that this might not be the case. If there has been an overestimation of the effects of the anterior bony spur in isolated subacromial impingement, patients may be comparatively more symptomatic from subacromial bursitis (or bursal degeneration) than previously thought.¹² It is known that corticosteroid injections have a local anti-inflammatory effect on the bursa and are a recognised treatment modality for subacromial impingement and therefore one could postulate that arthroscopic bursoscopy may dilute the effect of local inflammatory mediators associated with subacromial bursal degeneration leading to a reduction in pain.

Nonetheless, the results of the CSAW and FIMPACT trials clearly question the role by which subacromial decompression surgery is effective and raise the possibility that there is a significant placebo effect.

Whilst it is easy for surgeons to ignore the results of these important studies, good professional practice dictates that we must accept the results of these well designed trials and question our own clinical practice.

The British Elbow and Shoulder Society is working with the Royal College of Surgeons, the British Orthopaedic Association and NICE to producing revised commissioning guidelines for decompression surgery.

In addition, further clinical research is required to help surgeons define the criteria by which patients who would benefit from decompression surgery can be identified.

Finally, it is important to reiterate that the results from the CSAW and FIMPACT studies focus on isolated subacromial impingement and do not consider other possible co-existing shoulder pathologies for which subacromial decompression is performed concurrently.

Conflict of interest declaration

None.

References

1. Urwin M, Symmons D, Allison T, et al. Estimating the burden of musculoskeletal disorders in the community: the comparative prevalence of symptoms at different anatomical sites, and the relation to social deprivation. *Ann Rheum Dis.* 1998;57:649–655.
2. Linsell L, Dawson J, Zondervan K, et al. Prevalence and incidence of adults consulting for shoulder conditions in UK primary care; patterns of diagnosis and referral. *Rheumatology.* 2006;45:215–221.
3. Oh LS, Wolf BR, Hall MP, Levy BA, Marx RG. Indications for rotator cuff repair: a systematic review. *Clin Orthop Relat Res.* 2007;455:52–63.
4. Neer CS. Anterior acromioplasty for the chronic impingement syndrome in the

- shoulder. *J Bone Joint Surg Am.* 2005;87:1399.
5. Mitchell C, Adebajo A, Hay E, Carr A. Shoulder pain: diagnosis and management in primary care. *BMJ.* 2005;331:1124–1128.
 6. Hallgren HC, Holmgren T, Oberg B, Johansson K, Adolfsson LE. A specific exercise strategy reduced the need for surgery in subacromial pain patients. *Br J Sports Med.* 2014 Oct;48(19):1431–1436. <https://doi.org/10.1136/bjsports-2013-093233>.
 7. Ketola S, Lehtinen J, Rousi T, et al. No evidence of long-term benefits of arthroscopic acromioplasty in the treatment of shoulder impingement syndrome: five-year results of a randomised controlled trial. *Bone Joint Res.* 2013 Jul 1;2(7):132–139. <https://doi.org/10.1302/2046-3758.27.2000163>.
 8. Farfaras S, Sernert N, Rostgard Christensen L, Hallström EK, Kartus JT. Subacromial decompression yields a better clinical outcome than therapy alone: a prospective randomized study of patients with a minimum 10-year follow-up. *Am J Sports Med.* 2018 May;46(6):1397–1407. <https://doi.org/10.1177/0363546518755759>.
 9. Cummins CA, Sasso LM, Nicholson D. Impingement syndrome: temporal outcomes of nonoperative treatment. *J Shoulder Elbow Surg.* 2009;18:172–177.
 10. Kulkarni R, Gibson J, Brownson P, et al. Subacromial shoulder pain BESS/BOA patient care pathways. *Shoulder Elbow.* 2015;7(2):135–143.
 11. 2014 Commissioning Guide: Subacromial Shoulder Pain. BOA/RCS/CSP/BESS/ https://www.boa.ac.uk/wp-content/uploads/2014/08/Subacromial-Shoulder-Commissioning-Guide_final.pdf.
 12. Henkus HE, de Witte PB, Nelissen RG, Brand R, van Arkel ER. Bursectomy compared with acromioplasty in the management of subacromial impingement syndrome. *J Bone Joint Surg [Br].* 2009;91-B:504–510.
 13. Beard DJ, Rees JL, Cook JACSAW Study Group, et al. Arthroscopic subacromial decompression for subacromial shoulder pain (CSAW): a multicentre, pragmatic, parallel group, placebo-controlled, three-group, randomised surgical trial. *Lancet.* 2018;391:329–338. [https://doi.org/10.1016/S0140-6736\(17\)32457-1](https://doi.org/10.1016/S0140-6736(17)32457-1).
 14. <https://www.boa.ac.uk/wp-content/uploads/2017/11/BOA-and-BESS-statement-Subacromial-Decompression-21.11.17.pdf>.
 15. Jacobsen JR, Jensen CM, Deutch SR. Acromioplasty in patients selected for operation by national guidelines. *J Shoulder Elbow Surg.* 2017 Oct;26(10):1854–1861. <https://doi.org/10.1016/j.jse.2017.03.028>.
 16. Paavola M, Malmivaara A, Taimela S, et al. For the Finnish Shoulder Impingement Arthroscopy Controlled Trial (FIMPACT) Investigators. Subacromial decompression versus diagnostic arthroscopy for shoulder impingement: randomised, placebo surgery controlled clinical trial. *BMJ.* 2018;362:k2860. <https://doi.org/10.1136/bmj.k2860>.
 17. Moseley JB, O'Malley K, Petersen NJ, et al. A controlled trial of arthroscopic surgery for osteoarthritis of the knee. *N Engl J Med.* 2002;347:81. <https://doi.org/10.1056/NEJMoa013259>.
 18. Bradley JD, Heilman DK, Katz BP, Gsell P, Wallick JE, Brandt KD. Tidal irrigation as treatment for knee osteoarthritis: a sham-controlled, randomized, double-blinded evaluation. *Arthritis Rheum.* 2002;46:100–108. <https://doi.org/10.1002/1529-013>.

Simond Jagermath*, Patrick Groarke

Liverpool Upper Limb Unit, Royal Liverpool and Broadgreen University
Hospitals NHS Trust, UK

Peter Brownson

Liverpool Upper Limb Unit, Royal Liverpool and Broadgreen University
Hospitals NHS Trust, UK

British Elbow & Shoulder Society (BESS), UK

* Corresponding author.

E-mail address: sjagermath@hotmail.com (S. Jagermath).

27 November 2018

Available online 18 January 2019



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.**

