

# Evolution and Current Status of Arthroscopic Surgery in India

<sup>1</sup>David Rajan, <sup>2</sup>Mandeep S Dhillon, <sup>3</sup>Udai Cheema, <sup>4</sup>Devendra K Chouhan

## ABSTRACT

Arthroscopic surgeries are worldwide accepted modality to surgically treat the intraarticular injuries and ailment. The introduction and evolution of the same in our country was little late; however, an exponential improvement was observed in last one decade. Specialized workshops, conferences, and courses are the main sources for the learning and upgradation of surgical skills in this field.

**Keywords:** Arthroscopy, Evolution, Surgery.

**How to cite this article:** Rajan D, Dhillon MS, Cheema U, Chouhan DK. Evolution and Current Status of Arthroscopic Surgery in India. *J Postgrad Med Edu Res* 2018;52(1):22-25.

**Source of support:** Nil

**Conflict of interest:** None

## HISTORICAL PERSPECTIVE

Surgical expertise in India is recorded since times immemorial; there are records of medical treatment (*Ayurveda*) in many ancient Indian texts, and this science has purportedly been practiced since 1000 BC.<sup>1</sup> Three classical treatises were available in the ancient language Sanskrit, written by *Caraca*, *Sushruta*, and *Vagbhata*; *Sushruta* is focused chiefly on surgical issues. The author of the book—*Sushruta Samhita*—talks about 120 surgical instruments, and discusses 300 surgical procedures and cadaveric dissection. The text classifies human surgery into eight categories, with some focus on orthopedic issues; there is a recorded classification of bones, fractures, and dislocations, with some inputs regarding dislocation reduction and fracture immobilization, along with stress on rehabilitation.<sup>2</sup>

<sup>1</sup>Director, <sup>2</sup>Professor and Head, <sup>3</sup>Senior Resident, <sup>4</sup>Associate Professor

<sup>1</sup>Department of Orthopedics, Ortho One Orthopedic Speciality Centre, Coimbatore, Tamil Nadu, India

<sup>2,4</sup>Department of Orthopedics, Postgraduate Institute of Medical Education and Research, Chandigarh, India

**Corresponding Author:** Devendra K Chouhan, Associate Professor, Department of Orthopedics, Postgraduate Institute of Medical Education and Research, Chandigarh, India, Phone: +911722756742, e-mail: drdevnim@gmail.com

## GRADUAL DEVELOPMENT OF ARTHROSCOPIC SURGERY IN INDIA

India got the first glimpse of arthroscopic surgery in 1983 when Dr Harry Eikalar of the Netherlands visited South India, following which diagnostic arthroscopy was begun by a few inspired Indian surgeons. The Indian Arthroscopic Society of India (IAS) was established in 1985,<sup>3</sup> wherein leading arthroscopic surgeons namely Dr Bob Johnson, Dr Dinesh Patel, and Dr Gopal Krishnan had come for the meeting to teach surgeons of India.<sup>3</sup>

There was a time we had to rely upon “foreign traveling surgeons,” who visited various hospitals all over the country, and performed multiple operations over 1 or 2 days. Nevertheless, some surgeons ventured abroad for training and technology, and by the late 1980s, the concept of arthroscopic knee surgery was introduced in the major metropolitan cities of India with two International Society of Arthroscopy, Knee Surgery and Orthopedic Sports Medicine (ISAKOS)-accredited teaching centers.

Despite well-established orthopedic surgical practices in India, arthroscopy as a specialized form of surgery was not uniformly developed till the late 20th century, and even today specialized work is only being done in urban areas. Economic constraints, initial lack of exposure to this specialized surgical technology, and the relative discomfort of established leaders in the orthopedic fraternity to this new methodology, plus a relatively longer learning curve were the major factors for delay in establishing arthroscopy. Even today, the average orthopedic surgeon does not practice arthroscopy as an outline procedure, and most who do are comfortable with knee arthroscopy only. Areas like the shoulder arthroscopy are still picking up, while ankle, elbow, and hip arthroscopy are performed in selected niche centers.<sup>4,5</sup>

Notwithstanding the relative unavailability, the economics of knee ligament surgery in India are still very different from that in the developed world. A standard anterior cruciate ligament (ACL) reconstruction costs about US\$ 800 to \$2000, depending upon the type of hospital (government or corporate), the type of implant used (indigenous or biodegradable), and the location of the surgeon (metropolitan or small town).

However, presently, the facilities and technical skill possessed by Indian arthroscopic surgeons stand at par with their foreign counterparts. Now the Indian surgeons

are even traveling worldwide to conduct workshops and give live surgical demonstrations of various arthroscopic procedures.

### **A NATIONAL-LEVEL SURVEY**

There are around 55,000 orthopedic surgeons practicing in India, around 13,500 of who are members of the Indian Orthopedic Association. The IAS membership has crossed the 2000 member mark, with almost half of the new members having joined in the last 10 years.<sup>4</sup> This reflects upon the spurt in interest in the field of arthroscopy in the 21st century, with better training facilities in India; this has been augmented by the return of surgeons trained abroad, who have no setup practices or have joined the mushrooming corporate hospitals. To get an overview of the status of knee ligament reconstruction surgery in India, around 700 members of the IAS were asked to participate in an online and postal survey by the principal author (DR) in his capacity as president of the IAS. The focus was on preferences and practice of knee ligament surgery, with additional focus on practice profiles and training, technique of ligament reconstruction used, with specifics of graft fixation choices, type of implant used, and methods of rehabilitation. Seventy surgeons responded with adequately filled pro forma. Many of the deductions in this study are based on these data.

This survey, undertaken in the early 21st century, found that two wheeler accidents (motorcycle and scooter) constituted 52% of the cases that presented with knee ligament injury; 5% of these were multiligament injuries, with the driver being injured 96% of the time and the pillion rider sustaining this injury only 4% of the time. The mechanism of trauma seems to be the touching down of the involved leg, and the motorcycle pivoting along with the rider, on a stationary foot. This involves pivoting under pressure, and a rotational and translatory stress, which damages more than one ligament. The exact pattern of injury, however, varies due to other variables, and fractures are often part of the injury complex.

From our experience, and from the survey, it has been noted that operative management is focused on ACL reconstruction. Though many centers offer posterior cruciate ligament (PCL) and multiligament reconstructions, the vast majority treats PCL injuries nonoperatively, unless the avulsions are seen initially; posterolateral corner (PLC) injuries are still the most often missed injury, and are often diagnosed after an ACL reconstruction, with poor outcome. The IAS, with significant inputs from ISAKOS, has started training facilities for managing and PCL and PLC injuries in the last few years, which is done in the form of workshops and web-based teaching modalities.

Till 2001, about 7% of the surveyed surgeons were still doing ligament surgery by the open method; minimally invasive methods using the mini-open procedure were used by another 20% of the respondents,<sup>6</sup> while 70% of the surveyed Indian surgeons were doing arthroscopic-assisted ACL reconstruction. This percentage does not suggest the actual number of surgeons (in India) doing this procedure, nor does it reflect upon the actual number of cases being operated, as many surgeons in smaller towns may still be using the conventional open methods, though that number is now decreasing. A significant factor for decline in open surgery is patient education by media or otherwise, and the awareness in almost all orthopods that centers for arthroscopic surgery now exist. The PCL and PLC surgeries are still in the developmental stage; most surgeons do not have the requisite experience, and learning centers for this aspect of arthroscopic surgery are few and far apart.

Graft choice in India is also varied; 20% of the respondents in the IAS survey used bone patellar tendon (BPT) grafts in isolation, 28% using hamstrings by preference, while 24% were comfortable with both of the above. Surprisingly, 5% reported use of quadriceps tendon predominantly. Others or combinations were quoted at 28% and these included allografts (rare) and artificial ligaments. Allograft use in our country is still in its infancy due to inadequate graft banks, cost factor, and disease transmission issues.

Implant choice is another issue that is different in the subcontinent. A host of Indian surgical companies are manufacturing fixation devices at a fraction of the cost of internationally available ones. The surgeon survey showed up some preferences; those using BPT graft preferred the cheaper locally manufactured metal screws (71%) to bioscrews (25%), with 4% using other methods. Hamstring grafts were mostly fixed proximally by endobuttons and distally by suture discs (both manufactured cheaply by local manufacturers), with bioscrews coming as a distant second. Newer and more expensive devices like cross pins were used by a miniscule percentage of surgeons, with cost and lack of expertise being cited as contributing factors. This has changed since the original survey was conducted; in 2017 most arthroscopic surgeons are using bioresorbable screws, and the percentage of those using BPT grafts has come down.

Supervised rehabilitation is another issue that influences surgical outcomes; almost 25% of the surgeons surveyed did the rehab process personally; 70% have trained physiotherapist help, but many of these still have to be supervised for ACL rehabilitation. Issues related to home physiotherapy, patient compliance, and the use of postoperative motion control brace are also significant as cost, technical know-how, and availability and other

factors become relevant. Continuous passive motion after surgery is rarely used. In 2017, many centers of specialized physiotherapy have now come up in India; Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India, and the Sports Medicine Center of Safdarjang Hospital in Delhi are two reputed government institutes that run specialized physiotherapy centers, with the Sri Ramachandra Medical College and Research Institute University Sports Medicine department in the private sector gaining ground in recent years.

## SCIENTIFIC CONTRIBUTIONS

We reviewed the literature for publications on arthroscopy and arthroscopy-related surgery originating in India. Up until 2010, publications from Indian authors were few and far apart, with the Indian Journal of Orthopedics having less than five publications related to knee ligament reconstruction in its then 30-year publishing history. The relative paucity of published literature from Indian sources was a reflection of the lack of surgeons and centers actively involved in knee ligament reconstructions.

However, in the last 6 years, the scientific contributions from India in the field of arthroscopy and sports medicine from India have increased exponentially. Certain landmark publications are worth mentioning here, which include a novel technique for medial patellofemoral ligament reconstruction by Goyal<sup>7</sup> from Ahmedabad, proprioception in the ACL-deficient knees and its role in ACL reconstruction by Dhillon et al,<sup>8</sup> and work on the role of genetics and their association within ACL tears by John et al.<sup>9</sup> Besides these, multiple studies have come out of India that has enhanced our knowledge of sports injuries and related arthroscopic procedures in recent years.

## SPORTS-RELATED KNEE INJURY

As was shown by the previously mentioned survey, the epidemiology of knee ligament injury in India is significantly different from that seen in the Western world; where sports are concerned, indigenous sports like Kabbadi, Kho Kho, and Indian wrestling (Pehalwani) involve significant tackling and body contact. Dhillon et al<sup>10</sup> evaluated knee injuries in kabaddi players at the Sports Injury Clinic of the PGIMER, and brought to light the enormity of the burden of knee injuries in kabaddi players and the harsh toll it takes on the players' careers. One major issue is the delay in presentation due to relative lack of specialized diagnostics, trained personnel, and specialized centers. Hence, it was not uncommon to encounter patients after three to five significant episodes of injury in an ACL-deficient knee, where multiligament instabilities and both menisci damage

could have been prevented by early ACL reconstruction. An epidemiological study on the injuries in Indian cricket very well highlights the importance of having a regular, systematic injury surveillance program for cricket players with proper documentation and follow-up, which needed specialized centers in India itself to make this possible.<sup>11</sup>

## EVOLUTION OF ARTHROSCOPIC PRACTICE

In 2017, there has been a sea change in the Indian scenario in relation to arthroscopic surgery and management of knee and shoulder injuries. India boasts of multiple highly specialized centers focusing on sports-related injuries all over the country. The government has pitched in, and the Safdarjung Sports Injury Center has been developed with this thought process in mind. Leading hospitals in India like the PGIMER have dedicated Sports Injury Clinics since 2005, which have led to speedy, focused, and accurate diagnosis of sports injuries, and provide world class treatment to sportsmen in India itself.

## EDUCATIONAL ENDEAVORS

Annual ACL reconstructions done in India are nearly 125,000 operations per year compared with 5,000 to 10,000 done 5 years back. The credit for the same can be attributed to the increased number of courses, workshops, Continuing Medical Educations, and fellowships being introduced by various indigenous organizations/associations dedicated to sports medicine and arthroscopic surgery, such as IAS and the Indian Association of Sports Medicine.

It is pertinent to mention that the Medical Council of India has also introduced a specialized degree (MD) in sports medicine at few select institutes in India, and National Board of Examinations of India has started a two-year fellowship program in sports medicine and arthroscopy at two of the leading sports injury centers in India.

## THE WAY AHEAD

Indian surgeons in 2017 can take pride in the fact that we now have the know-how and the expertise to impart any kind of specialized arthroscopic surgery in India, albeit at large urban centers and hospitals. Nevertheless, we have come a long way in the development of the field of arthroscopy over the last 40 years. With more and more young surgeons venturing into arthroscopic surgery, adding to the vast pool of knowledge and experience of their seniors, it is certain and inevitable that Indian arthroscopic surgeons have a bright future and will make even greater contributions to the field globally.

## REFERENCES

1. Williams NS, Bulstrode CK, O'Connell PR, editors. Bailey & Love's short practice of surgery. 26th ed. Florida: CRC Press; 2013.
2. Bhashagrantha KKL. (Ed). The Sushruta Samhita. Calcutta: KKL Bhashagrantha; 1907.
3. Rajan, D. Personal communication. Data on file. Available from <http://indianarthroscopy.co.in/>
4. Dhillon MS, Gill HS. Sports injuries: what is new today? Ceylon Med J 2005 Jul;50(2):43-45.
5. Dhillon MS. Editorial; sports injury management: where are we today? Bull PGI 2005;39(4):137-140.
6. Dhillon MS, Joseph S, Nagi ON. Anterior cruciate ligament reconstruction by mini arthrotomy method. Indian J Orthop 2001;35(1):25-30.
7. Goyal D. Medial patellofemoral ligament reconstruction: the superficial quad technique. Am J Sports Med 2013 May;41(5):1022-1029.
8. Dhillon MS, Bali K, Prabhakar S. Proprioception in anterior cruciate ligament deficient knees and its relevance in anterior cruciate ligament reconstruction. Indian J Orthop 2011 Jul-Aug;45(4):294-300.
9. John R, Prabhakar S, Dhillon MS, Anand A, Minhas G. Association of ACL tear and single nucleotide polymorphism in the collagen XII gene in the Indian population—a preliminary case-control study. Muscles Ligaments Tendons J 2016 Sep;6(2):253-257.
10. Dhillon MS, John R, Sharma S, Prabhakar S, Behera P, Saxena S, Singh H, Chouhan D. Epidemiology of knee injury in Indian Kabaddi players. Asian J Sports Med 2017; 8(1):e31670.
11. Dhillon MS, Soni RK, Aggarwal S, Dhillon H, Prabhakar S. Epidemiology of orthopaedic injuries in Indian cricket. A prospective one year observational study. J Postgrad Med Edu Res 2015 Oct;49(4):168-172.