



ORTHO NEWSCAST



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Dear Doctor,
Greetings from Micro Labs. We are happy to bring you "Ortho Newscast" which contains latest and interesting news in the field of Orthopaedics.

This issue contains

- A comparison of surgical technique of Autologous collagen-induced chondrogenesis versus microfracture for chondral defects of the knee.
- Supraspinatus calcific tendinitis in an Infant – A case report.
- A novel Surgical Tape to Seal Internal Wounds

Should you require any specific article or medical information, please feel free to contact us at medicalservices@microlabs.in

Looking forward to your valuable feedback

Best Regards,
Medical Team,
Micro Labs Limited



A comparison of surgical technique of Autologous collagen-induced chondrogenesis versus microfracture for chondral defects of the knee.

Osteochondral lesions are common in knee and commonest cause of knee pain affecting all age groups and at times can be debilitating.

Currently, microfracture is the gold standard of treatment for small articular cartilage defects less than 9 mm in diameter. But it has disadvantages as the cartilage formed consists mainly of fibrocartilage rather than hyaline cartilage. Fibrocartilage has inferior wear characteristics and may lead to poorer clinical outcomes.

Recently, a novel single-stage procedure has been gaining popularity for repair of cartilage defects. Autologous collagen-induced chondrogenesis (ACIC) is a cost-effective method of treatment of chondral defects.

Aim of the current study is to compare clinical outcomes between the ACIC technique and microfracture alone over a 24-month study period.

Methods:

Single centre longitudinal study done by a single surgeon. 12 patients who underwent chondroplasty using CartiFill procedure were compared with age and sex-matched patients who underwent microfracture-only procedure.

Clinically symptomatic patients with MRI (Magnetic Resonance Imaging) proven chondral injuries in a single knee were selected.

Excluded patients with concurrent ligament injuries and meniscal injuries, those with chondral injuries with depth more than grade 3 (International Cartilage Regeneration and Joint Preservation Society, ICRS) were isolated.

Patients with arthritis due to rheumatological causes and patients who underwent prior invasive procedures in the same knee were excluded.

Patients were followed up for a minimum of 24 months, and they were clinically assessed pre and post-operatively at 24 months for International Knee Documentation Committee (IKDC) and Knee Injury, SF-36 and VAS (Visual Analog Scale) scores.

The 8 domains (Physical Functioning, Social Functioning, Role Physical, Bodily Pain, Mental Health, Role-Emotional, Vitality, and General Health) of SF-36 were transformed into 2 summary scores: Physical Component Score (PCS) and Mental Component Score (MCS).



Surgery:

In supine position under general or regional anaesthesia, a non-sterile pneumatic tourniquet was applied circumferentially around the thigh, Pre-operatively and inflated to 100 mmHg above systolic blood pressure 10 min after antibiotic prophylaxis is given.

ACIC procedures were performed entirely by arthroscopy via standard anterolateral and anteromedial portals. A standard diagnostic arthroscope with sterile saline irrigation was performed.

Then, chondral defect was identified and classified according to the ICRS classification. After determining the size and location of the lesion, the exposed bone was prepared with probe, curettes and shavers till stable, smooth and perpendicular borders were defined.

Microfracture procedure was performed with standard microfracture awls. The angled awl was used to penetrate the subchondral bone perpendicularly to a depth of 6 mm, with each hole a minimum of 3–4 mm apart.

The second part of the surgery was performed under dry arthroscopic conditions. The normal saline irrigation was stopped and remaining fluid in the knee joint was removed via the shaver or angled suction tube. A carbon dioxide insufflator was connected and the joint was distended with carbon dioxide at a pressure of 20 mmHg, at a flow rate of 20 L/min.



It pushes surrounding synovium away and allow a dry prepared site for the Cartifill. The chondral lesion was dried using surgical Rayon patties inserted through the arthroscopic portal with an artery forceps. At this point, the Cartifill was prepared on the bench. Two 1 ml syringes, one filled with 1 mL of fibrinogen , one filled with 0.9 ml of Atelocollagen and 0.1 ml of thrombin. Cartifill was combined with the fibrin glue in a 1:1 ratio with the aid of a Duploject Double-Barreled Syringe Applicator device and an 18G blunted drawing-up needle.

Then, Needle was introduced into the joint through an appropriate arthroscopic portal and the mixture was applied over the lesion until it was equal in height to that of the surrounding cartilage. The gel mass was shaped in-situ using a McDonalds dissector. The mixture was allowed to polymerize for a minimum of 5 min.

Intra articular space was kept dry with a combination of suction and surgical Rayon patties during the polymerization process. Once complete polymerization has occurred, the CO₂ inflow was shut off and fluid irrigation of the joint was restarted.

In order to confirm that the mixture was stable and adherent to bone, the lesion was probed and the knee was gently mobilised through a full range of motion. Eventually pneumatic tourniquet was deflated to promote bleeding from the microfracture sites.

The arthroscopic portals were closed with Ethilon 4-0 and waterproof dressings were applied.

Patients were discharged either on the day of surgery or the following day. To protect the ACIC scaffold, postoperative range of motion of the knee was limited to 0–90° by a hinged knee brace. Patients were also told not to bear weight on the operated limb for the first three weeks and to start partial weight-bearing after three weeks.

Complete weight-bearing and full range of motion of the operated limb was allowed at 6 weeks post operation.

Results:

The microfracture group demonstrated a SF-36 PCS score improvement from 42.3 to 73.6 ($p = 0.006$), SF-36 MCS score improved from 46.8 to 61.4 ($p = 0.022$). IKDC total score improved from 55.7 to 68.5 ($p = 0.002$).

In patients among CartiFill group demonstrated 24 month SF-36 PCS improvement from 40.0 to 78.2 ($p = 0.003$), SF36 MCS score improved from 47.7 to 84.1 with a ($p < 0.001$). IKDC scores improved from 58.0 to 80.6 ($p < 0.001$).

At 24 months there was statistical significance in the mean difference comparing CartiFill vs Microfracture-only in both SF-36 MCS ($p = 0.017$) and IKDC scores ($p = 0.001$).

Discussion:

Treatment of chondral defects generally focuses on the stimulation of mesenchymal stem cells and formation of fibrocartilage, which is not as robust and durable as hyaline cartilage.

Many techniques have been described to improve the quality of cartilage regenerated which include microfracturing, osteochondral autografts and allografts, autologous chondrocyte implantation and autologous matrix induced chondrogenesis (AMIC).

Microfracture is currently the first-line treatment of grade III or IV chondral injuries which employs marrow-based strategy for cartilage repair.

ACIC of the knee is a joint-preserving surgery single-stage, low morbidity, that potentiates return to a healthy lifestyle.

The advantage of CartiFill over patch scaffolds is that when it is combined with fibrin glue, the injectate can easily fill up defects of any size, depth or shape.





Autologous collagen-induced chondrogenesis is an effective, single-stage, joint-preserving procedure which is comparable to microfracture in treating chondral defects.

Reference:

Silva AN et al. Autologous collagen-induced chondrogenesis versus microfracture for chondral defects of the knee: Surgical technique and 2-year comparison outcome study. Journal of Orthopaedics. 2020; 22:294–299.

Supraspinatus calcific tendinitis in an Infant - A case report.

Supraspinatus Calcific tendinitis is the reactive calcification of the rotator cuff tendons and one of the main causes of acute shoulder pain in adults.

It is commonly found in people aged 30–60 years, rarely found in children.

Current is a case of 2-year-old boy with calcific supraspinatus tendinitis, youngest case.

Case presentation:

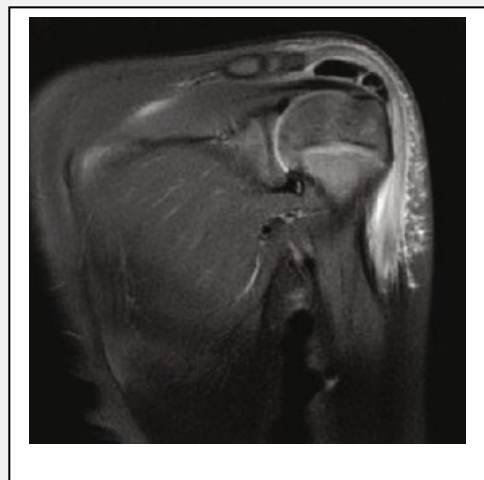
A healthy 2-year-old boy did not want to move his left shoulder as informed by mother. No history of injury or of previous symptoms in the affected arm. At the time, they were instructed to rest at home. But 2 days later, he developed a fever of 38°C, and the mother took him to hospital.

Physical examination revealed high body temperature of 38.6°C, slight swelling in his left shoulder, but the local temperature of his left shoulder was almost normal. There was marked tenderness, with palpation resulting in excruciating pain over the lateral part of his left shoulder.

Passive and active movements of his left shoulder were almost completely restricted due to the severe pain on any attempt at moving it.

Results of biochemistry revealed slightly elevated white blood cell (WBC) count at $10.77 \times 10^9/L$ and C-reactive protein (CRP) of 3.27 mg/dL.

Radiograph of the left shoulder revealed a large ovoid radiopaque area measuring 2×1 cm in the subacromial region, impinged between the humerus and acromion. There was no obvious intralesional osseous trabeculation or cortical rim to suggest a bony origin.



magnetic resonance imaging (MRI) of his left shoulder performed under anesthesia confirmed the ovoid lesion with a hypointense signal on both T1- and T2- weighted sequences above the supraspinatus tendon, just proximal to its insertion at the greater tuberosity as shown in figure.

The imaging findings strongly suggested calcific supraspinatus tendinitis.

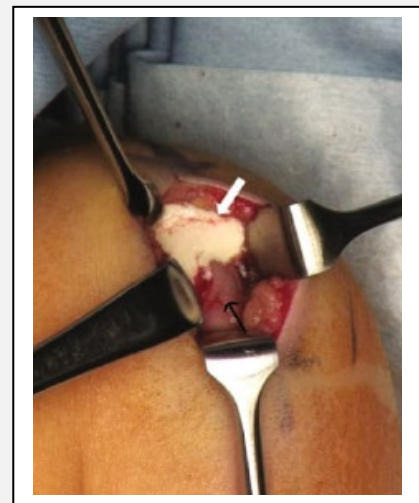
To exclude infection or soft tissue tumor and establish a definitive diagnosis, we performed an open biopsy and resection.

Under general anesthesia, a 2-cm skin incision was made lateral to the acromion. After dividing the deltoid muscle, a capsulated white mass was noted on the supraspinatus muscle. After capsule was incised, white paste exuded, which nearly confirmed the diagnosis of calcific tendinitis.

Tissue for rapid intraoperative pathological examination, showed only calcification without tumor cells or bacterium, thus confirming the diagnosis.

Following , the white capsule was removed as carefully as possible to avoid damage to the supraspinatus muscle, and after a thorough wash, restored the deltoid muscle and closed the wound.

After Two days of surgery, the patient's body temperature decreased and he could move his left shoulder without pain, so he was discharged 1 day later.



Radiographs taken 2 weeks after the surgery showed that the mass had disappeared; the culture test was also negative. The left shoulder pain had completely subsided, and the range of shoulder motion returned to normal without any pain during movement.

After one year of surgery, there was no recurrence or pain and normal range of motion of the shoulder was maintained, but the operation scar was noticeable.

Discussion:

Calcific tendinitis of the rotator cuff is one of the most common causes of non-traumatic pain in the shoulder. It is caused by macroscopic deposition of hydroxyapatite, a crystalline form of calcium phosphate, in the rotator cuff tendons .

X rays show typical calcific deposit. In general, treatment options consist of conservative therapy, such as nonsteroidal antiinflammatory drugs, and injection of a local anesthetic with or without steroid infiltration.

In failed conservative treatment , fluoroscopy-guided needle aspiration or arthroscopic surgery is typically considered.

Conclusion:

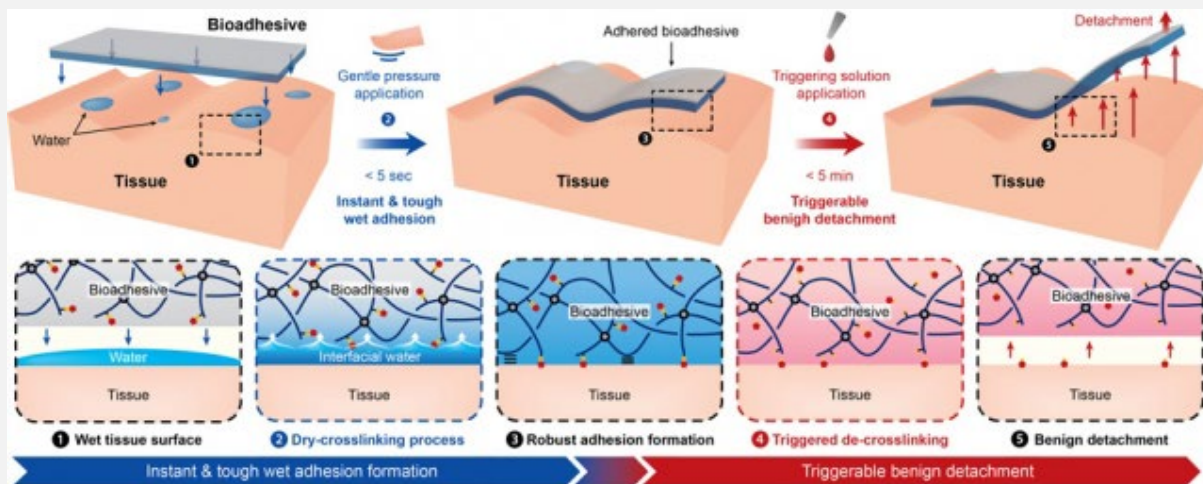


Reference:

Wako M et al. Calcific Tendinitis of the Supraspinatus Tendon in an Infant. Case Reports in Orthopedics. 2020; 9842489:1-3 pages

IN THE NEWS

A novel Surgical Tape to Seal Internal Wounds



Researchers have developed an adhesive tape that helps surgeons to seal internal wounds. It can readily stick to slippery internal surfaces, as a potential replacement for sutures. But the adhesive worked a little better, and was difficult to remove or adjust without causing irritation or tissue damage.

A new version of the tape that can be readily detached from the tissue surface by applying a liquid solution. The development makes the tape safer and easier to use, and allows surgeons to remove it once tissue healing has completed or adjust the tape's position if required.

The tape is conceived as a replacement for internal sutures. The original adhesive included polyacrylic acid and NHS esters, which form long-lasting bonds with the tissue surface. However, these bonds were so strong that it was difficult to remove the tape without causing damage.

Removing tape could potentially create more of an inflammatory response in tissue, and prolong healing, to address this, the researchers added a disulfide linker molecule that

can be easily severed when exposed to a reducing agent, meaning that the covalent bonds between the adhesive and surface proteins in the tissue can be broken. The resulting tape can be sprayed with a reducing solution and it can then be readily peeled from a tissue surface, regardless of how long it has been in place. Most importantly, the removal is painless and does not cause tissue damage.

Reference: Available at : <https://www.medgadget.com/2020/06/easily-removable-surgical-tape-lets-surgeons-seal-internal-wounds.html>. Accessed on 06-07-2020.



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