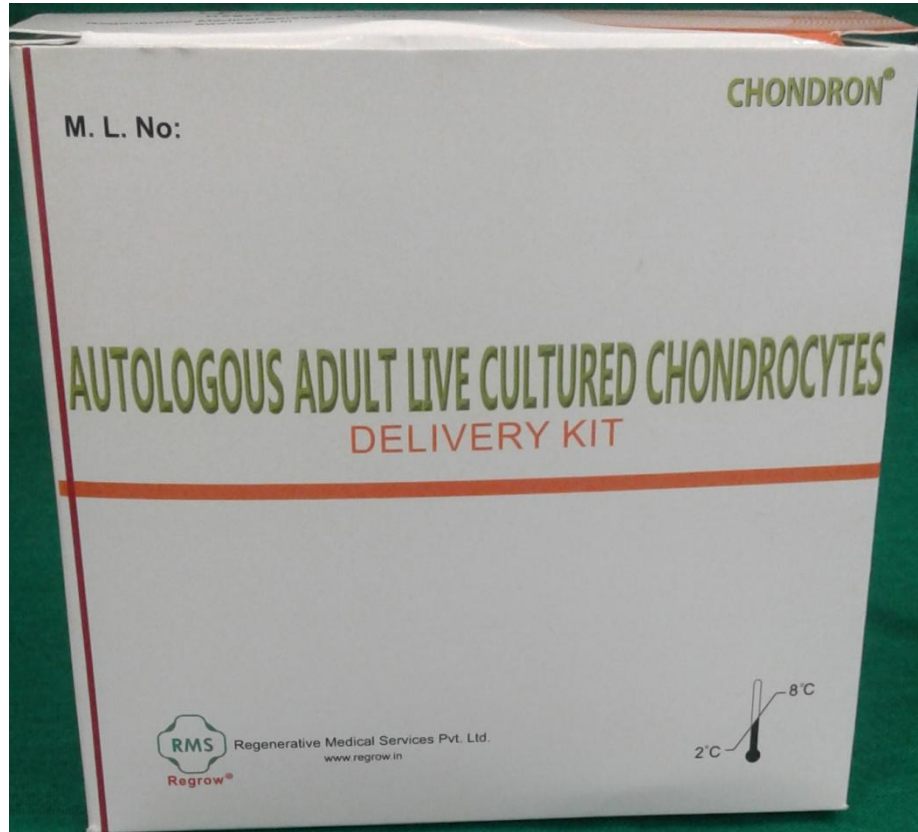


IMPLANTATION MANUAL FOR CARTIGROW®

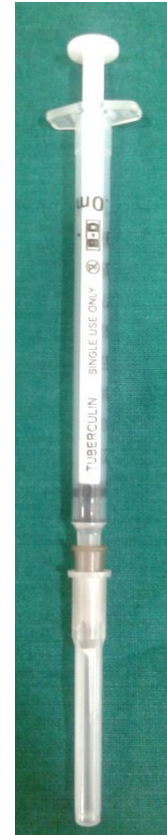
AUTOLOGOUS ADULT LIVE CULTURED CHONDROCYTES

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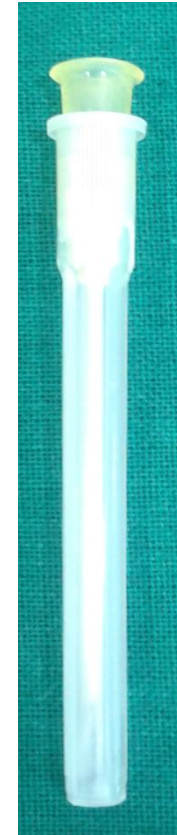
CONTENTS OF PRODUCT BOX



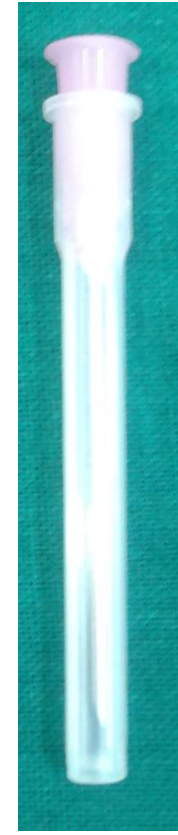
Delivery Kit



**1 ml Syringe
(10 Nos.)**

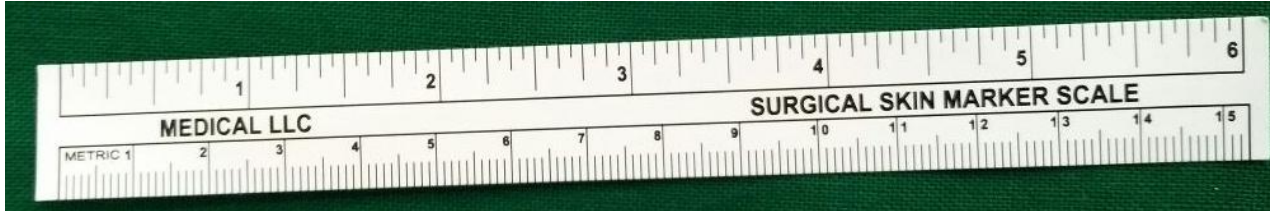


**20 gauge needle
(10 Nos.)**



**18 gauge needle
(05 Nos.)**

OTHER ASSISTING MATERIAL



Sterile Scale (1 No.)

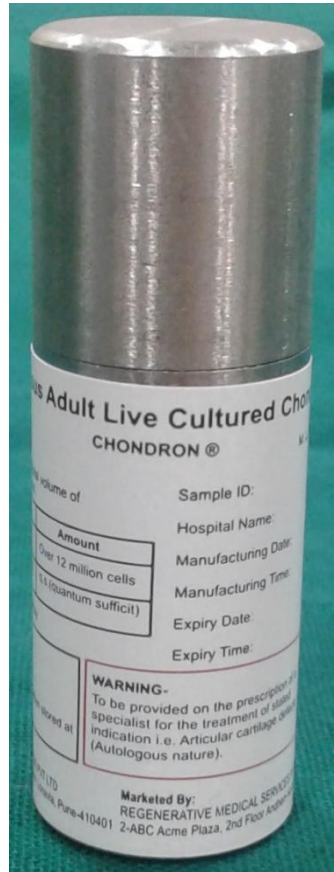


Marker (1 No.)

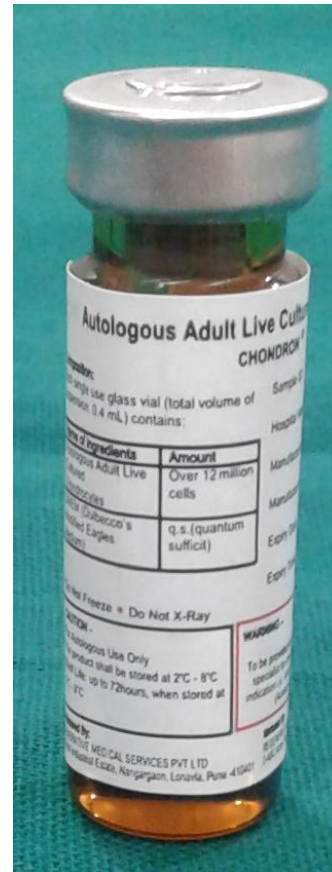


Fibrinotherm

CONTENTS OF DELIVERY KIT



Outer Vial (Non-sterile) (Metal Canister)



Inner Glass Vial containing final product (sterile) [Max. up to 04 vials]

Final Product: Over 12 million Autologous Adult Live Cultured Chondrocytes (CARTIGROW®) in 0.4 ml DMEM solution

INNER VIAL (PRIMARY PACKAGING) LABEL



Autologous Adult Live Cultured Chondrocytes CHONDRON®

Composition:

Each single use glass vial (Total volume of Suspension: 0.4 ml) contains:

Autologous Adult Live Cultured Chondrocytes..... Over 12 million cells
DMEM (Dulbecco's Modified Eagles Medium)q.s

INDICATION: Treatment for Articular cartilage defects (Autologous nature)

CAUTION:

- For Autologous Use Only
- The product shall be transported and monitored at 2°C to 8°C
- Shelf Life up to 72 hours, when stored at 2°C to 8°C
- Do not use if there is visible change of color of solution from Red to Yellow or Brown
- Do not mix with other solvents or components

Sample ID:

Hospital Name:

Manufacturing Date:

Manufacturing Time:

Expiry Date:

Expiry Time:

WARNING

- Do not Freeze
- Do not expose to X-Ray

M. L. No.: MH/102269

Manufactured By:

REGENERATIVE MEDICAL SERVICES PVT LTD

Survey No. 43, Plot No. 22, Shah Industrial Estate, Nangargaon, Lonavla, Pune -410401

Marketed By:

REGENERATIVE MEDICAL SERVICES PVT LTD

2-ABC, Acme Plaza, 2nd Floor, Andheri –Kurla Road, Andheri (E), Mumbai-400059

®: Registered Trademark

DK/CHV/01

Activ
Go to

OUTER VIAL (SECONDARY PACKAGING) LABEL



Autologous Adult Live Cultured Chondrocytes CHONDRON®

Composition:

Each single use glass vial (Total volume of Suspension: 0.4 ml) contains:

Autologous Adult Live Cultured Chondrocytes..... Over 12 million cells
DMEM (Dulbecco's Modified Eagles Medium)q.s

INDICATION: Treatment for Articular cartilage defects (Autologous nature)

CAUTION:

- For Autologous Use Only
- The product shall be transported and monitored at 2°C to 8°C
- Shelf Life up to 72 hours, when stored at 2°C to 8°C
- Do not use if there is visible change of color of solution from Red to Yellow or Brown
- Do not mix with other solvents or components

Sample ID:

Hospital Name:

Manufacturing Date:

Manufacturing Time:

Expiry Date:

Expiry Time:

WARNING

- Do not Freeze
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Marketed By:

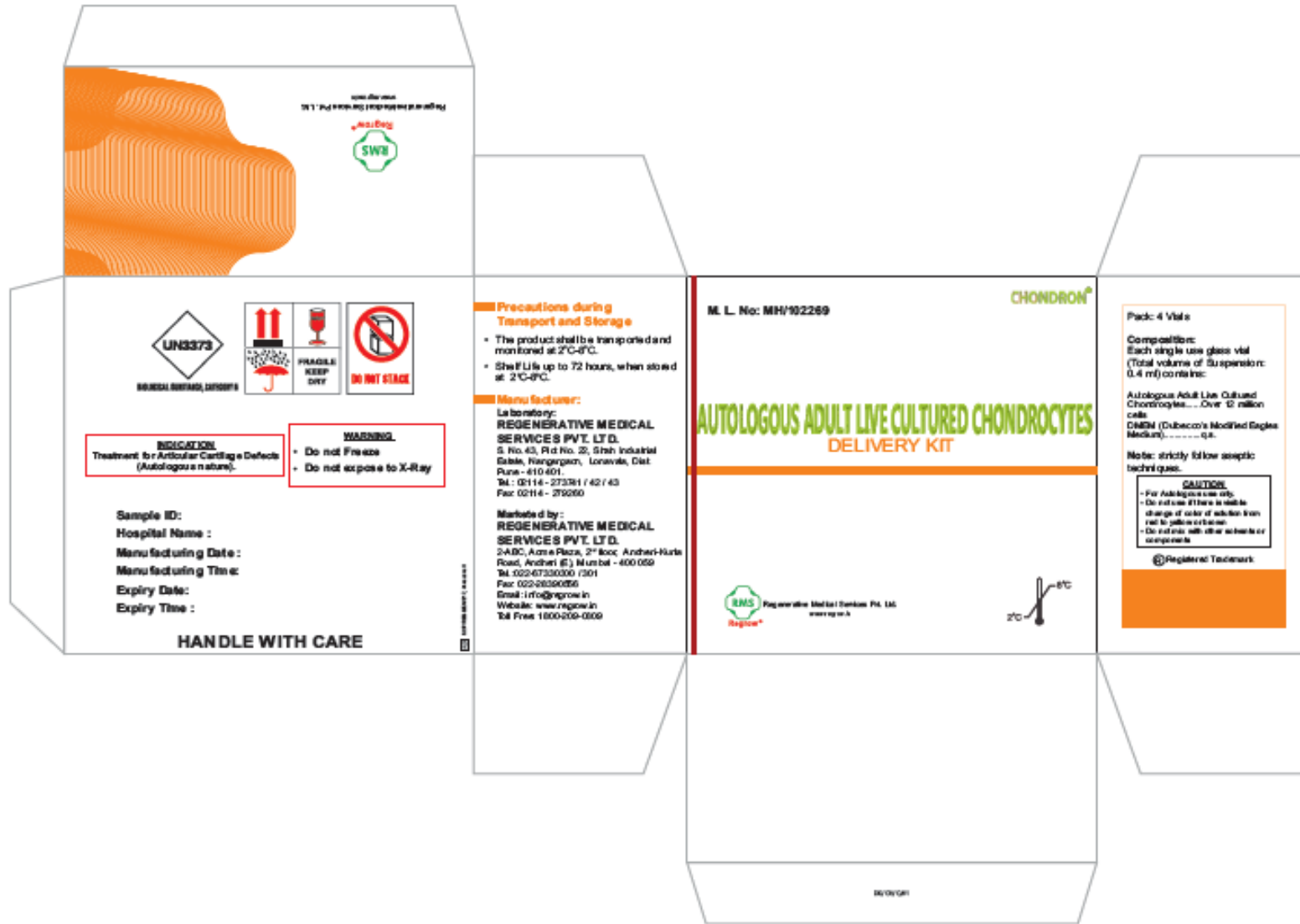
REGENERATIVE MEDICAL SERVICES PVT LTD

2-ABC, Acme Plaza, 2nd Floor, Andheri –Kurla Road, Andheri (E), Mumbai-400059

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CARTON LABEL

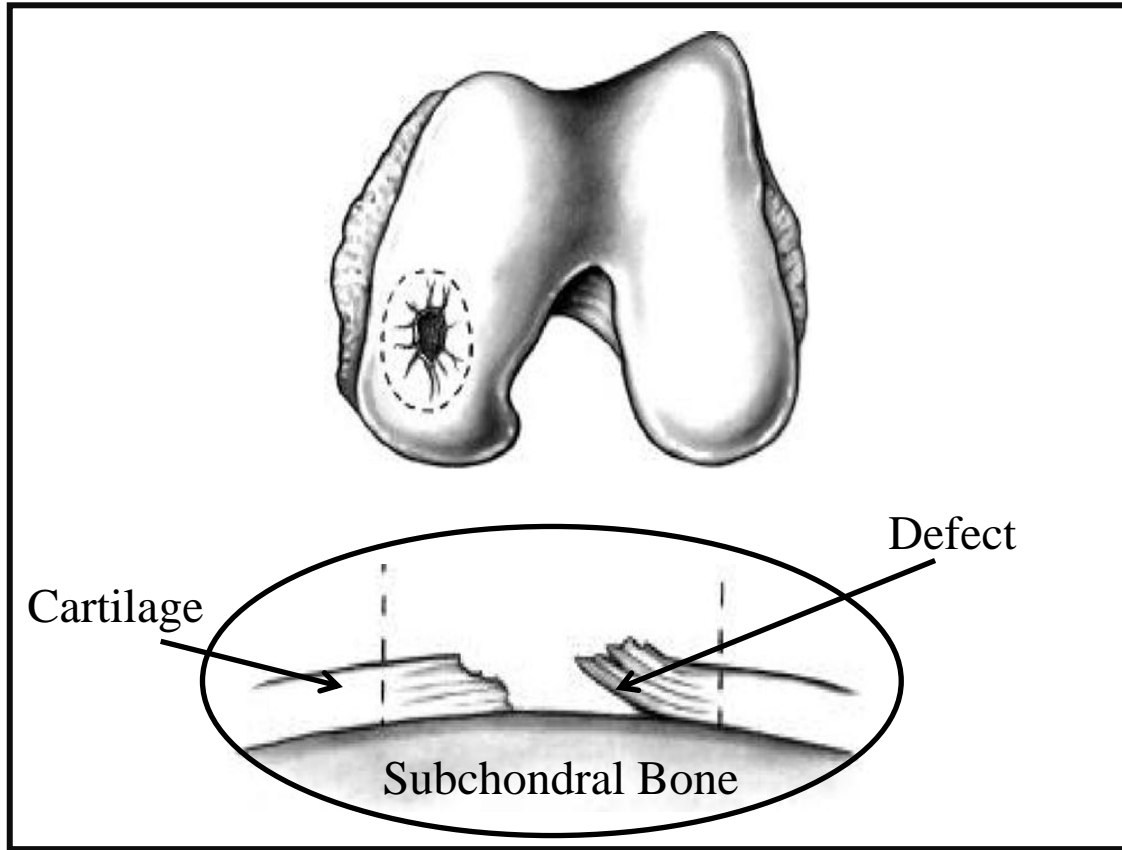


PRECAUTIONS BEFORE IMPLANTATION

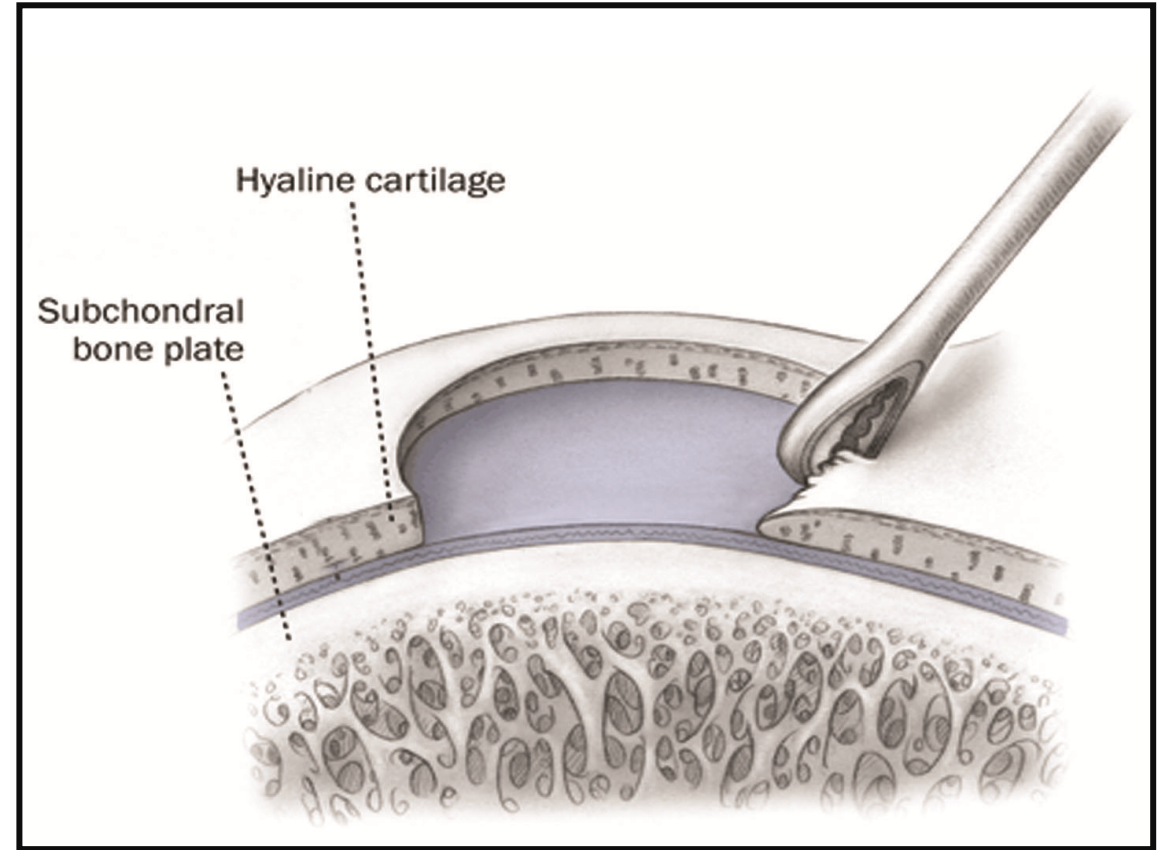


- Just before implantation, place the Delivery Kit on non-sterile trolley. Remove the Outer Vial(s) from the carton and place it on the same trolley.
- Take out the Inner Glass Vial(s) and with the help of sterile gauze piece wipe the Inner Glass Vial(s) containing final product on sterile trolley.
- If media of inner vial is cloudy or showing any foreign particles, do not use the vial, instead use new vial.
- Do not use the vial if there is visible change of color of solution from red to yellow or brown.
- If any vials in the Delivery Kit are damaged or has caused leakage or mislabeling on vial(s), do not use the vial, instead use new vial.

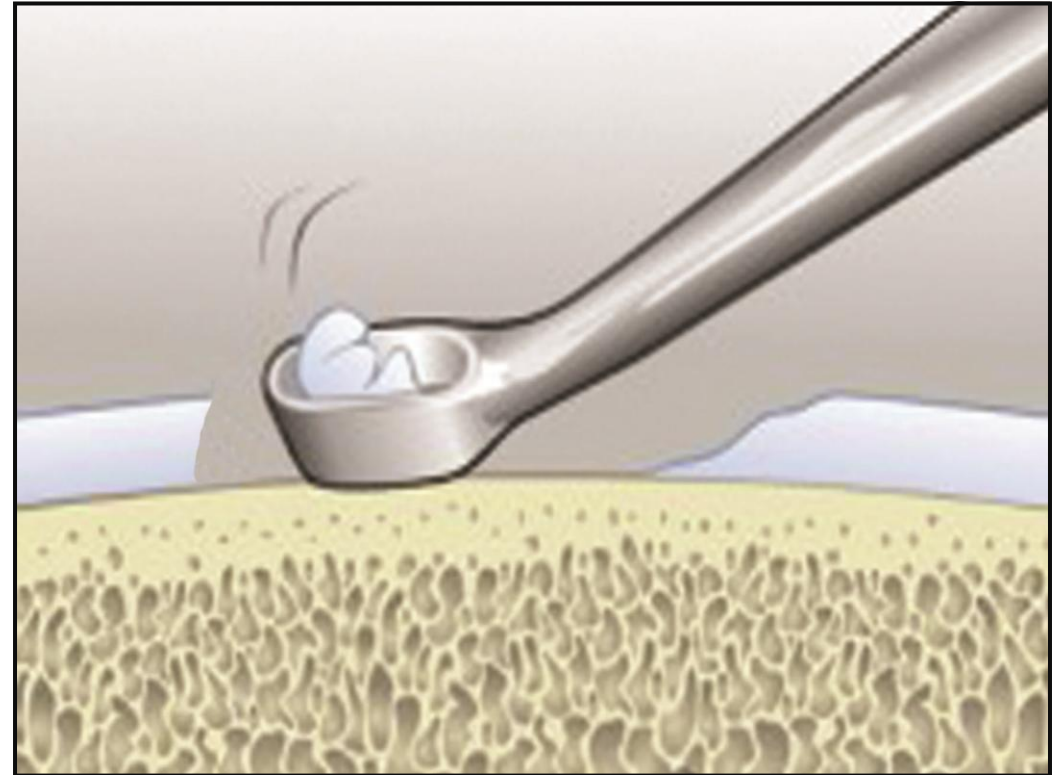
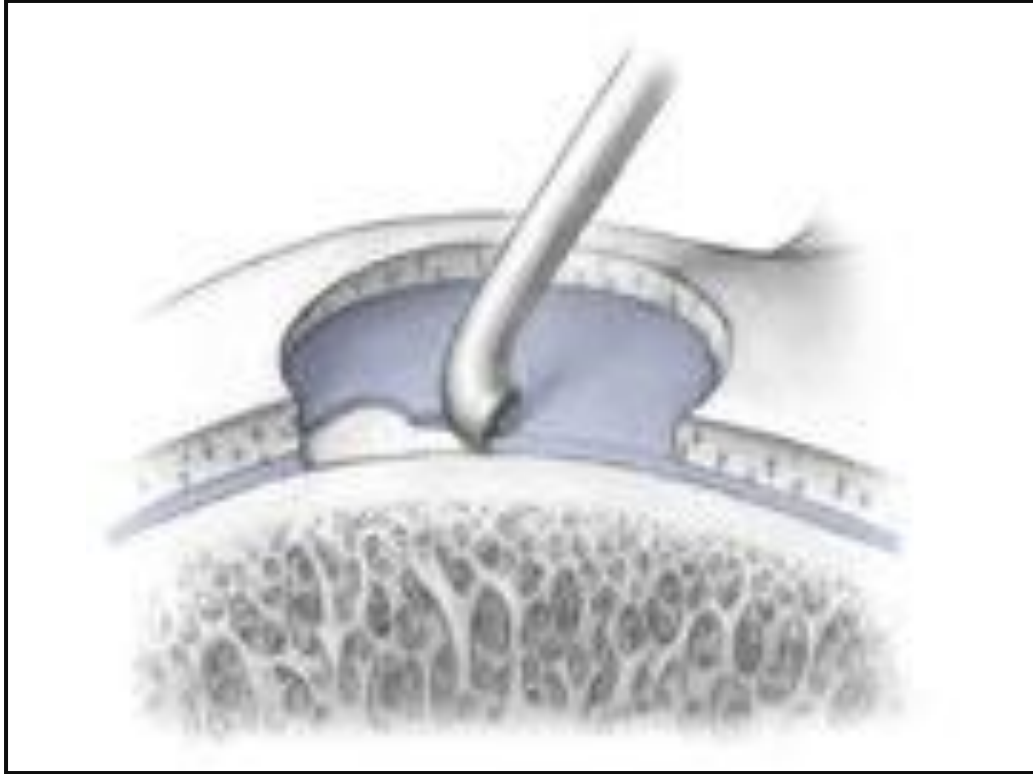
Step 1- Cartilage Defect is identified and measured with sterile scale



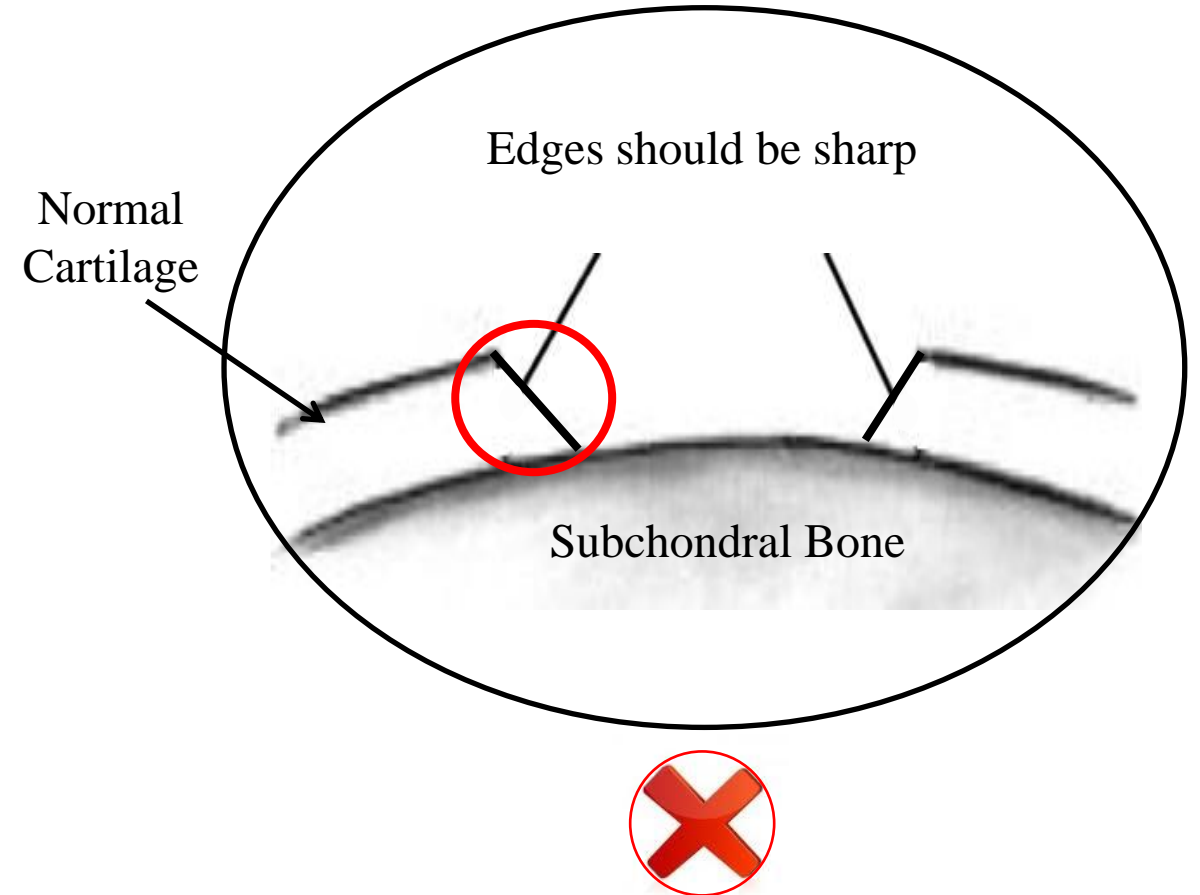
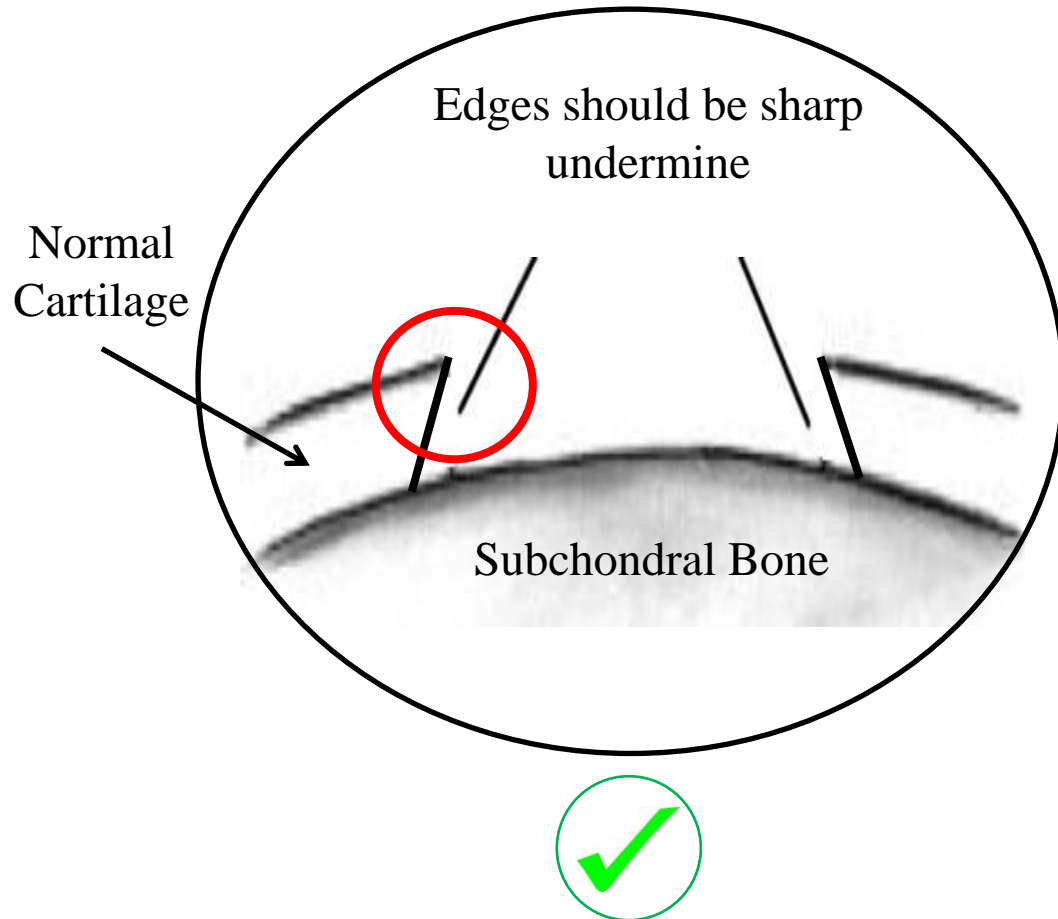
Step 2- Defect debridement with rim creation



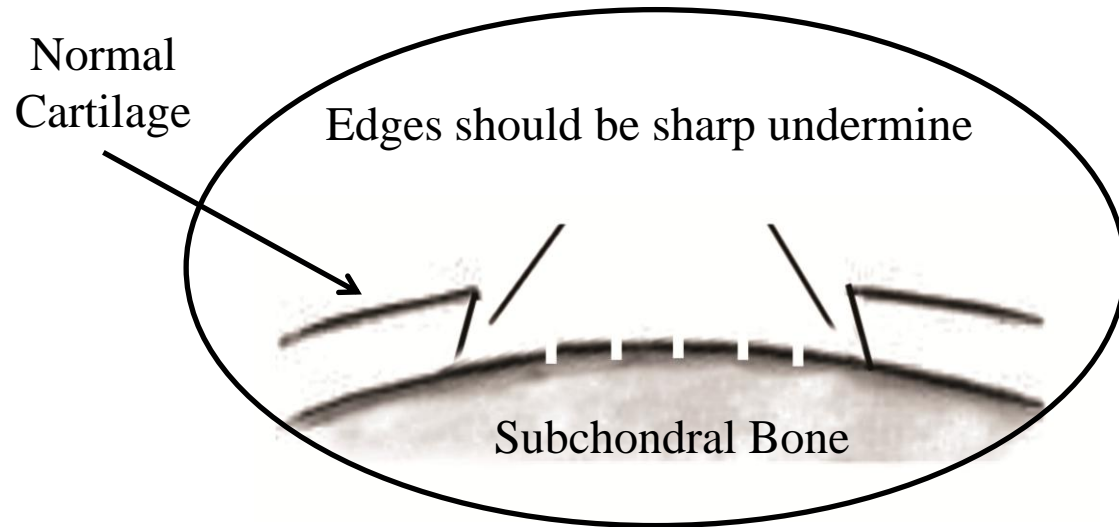
Step 3- Curette up to sub-chondral bone



Step 4- Edges should be sharp and remove all fibrous tissue from the defect area



Step 5- Drill hole 2-3 mm deep with 2 mm drill bit (2-3 holes/sq.cm)



2 mm drill bit
2 mm deep drilling

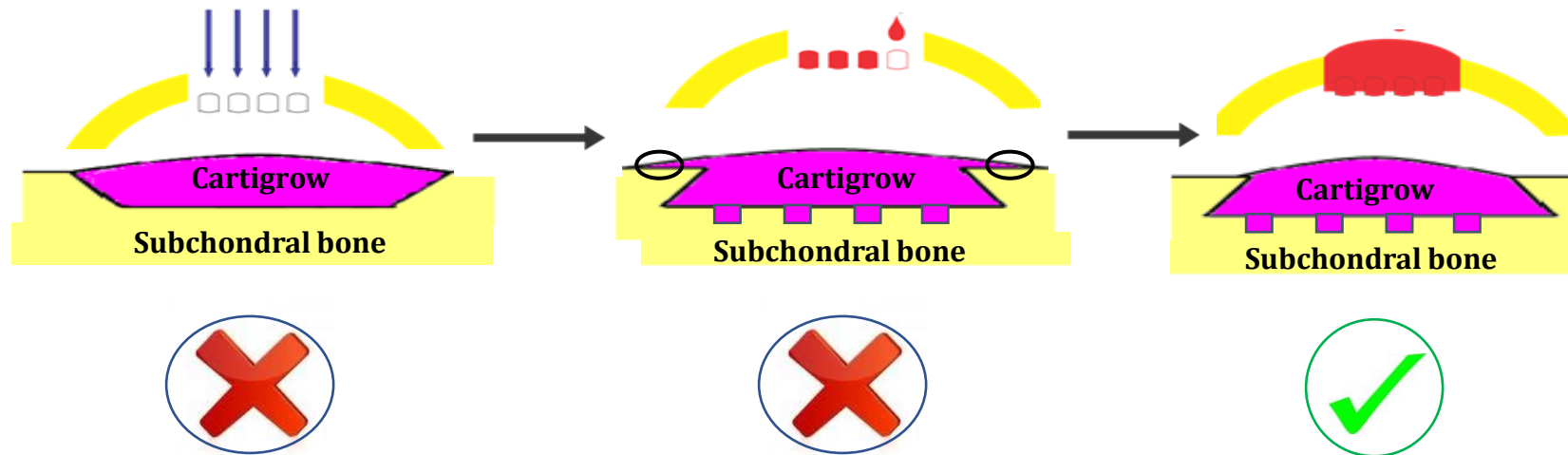


Implant area should be dry, NO BLEEDING !

Step 6- Pour saline on defect area to confirm gravity eliminated position and spillage, if any

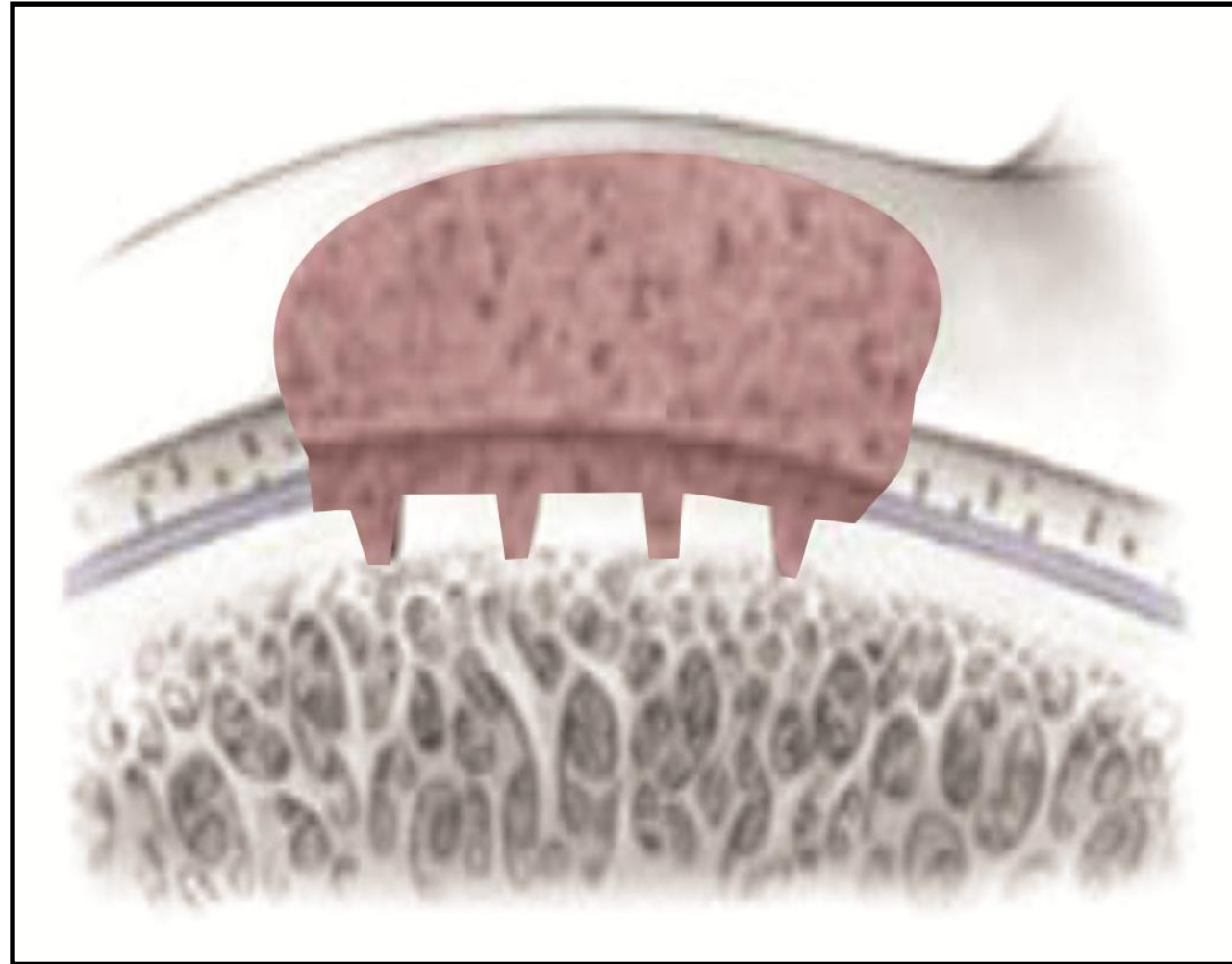


Step-7 Filling of defect area with final product



- Slowly inject the chondrocytes onto the defect.
- First fill the holes.
- Then evenly distribute the cells by moving the injection central to peripheral and peripheral to central.
- Cell volume must be distributed proportionately with respect to defect size.

Step-8 After CARTIGROW[®] is implanted, wait for 8-10 mins, keeping the limb in gravity eliminated position



Step- 9 After 8-10 mins check for stability gently by Flexing and Extending of the limb 2-3 times



- Perform routine closure of the joint with standard medical procedure of suturing and follow rehabilitation protocol advised by treating physician or specialist.

Gel-Based Autologous Chondrocyte Implantation (GACI) in the Knee: Multicentric Short Term Study

Shaival Dalal, Nilesh Shah, Dinkar Pardiwala, David Rajan, Satyen Sanghavi, Charul Bhanji

Abstract—Autologous Chondrocyte Implantation (ACI) is used worldwide since 1998 to treat cartilage defect. Gel-based ACI is a new tissue-engineering technique to treat full thickness cartilage defect with fibrin and fibrin glue as scaffold for chondrocyte. Purpose of this study is to assess safety and efficacy of gel based ACI for knee cartilage defect in multiple centres with different surgeons. Gel-based Autologous Chondrocyte Implantation (GACI) has shown effectiveness in treating isolated cartilage defect of knee joint. Long term results are still needed to be studied. This study was followed-up up to five years and showed benefit to patients. All enrolled patients with a mean age of 28.5 years had an average defect size of 3 square centimeters, and were grade IV as per ICRS grading. All patients were followed up several times and at several intervals at 6th week, 8th week, 11th week, 17th week, 29th week, 57th week after surgery. The outcomes were measured based on the IKDC Subjective and Objective and MOCAKT scores.

Keywords—Knee, chondrocyte, autologous chondrocyte implantation, gel.

I. INTRODUCTION

DAMAGE to the knee joint cartilage never heals on its own. It leads giving poor quality of fibrous tissue which can lead to early arthritis restricting joint movement. Articular cartilage is a white, strong, resilient tissue comprising less than 5% cells, about 35% extracellular matrix of mostly collagen type II and proteoglycans and about 60% water, and provides outstanding biomechanics. Hence the tissue looks simple in its structure; the biomechanical properties are linked to the complex nanostructural architecture of the tissue, which partly relates to the high water content bound to macromolecules. As articular cartilage has only limited ability to regenerate, many treatment modalities have been developed during the past several decades to treat symptomatic articular cartilage injuries. Microfracture or marrow stimulation, an older procedure used to treat cartilage defect gives slightly better quality of fibrous tissue. Autologous chondrocyte implantation (ACI) is a well-established procedure and known to regenerate hyaline or hyaline like cartilage. Autologous chondrocyte transplantation has changed the paradigm of the treatment of cartilage defects from repair to regeneration. Autologous chondrocyte implantation is a technique in which cells are delivered in debrided cartilage defect and covered with periosteal flap harvested from tibia. Drawbacks in this technique are leakage of cells, harvesting of periosteal flap, hypertrophy of cartilage, difficulty in treating irregular defect, difficulty in suturing on cartilage. To resolve these problems,

Gel based autologous chondrocyte implantation fibrin is used as scaffold for implanting chondrocyte cells onto cartilage defect. As fibrin and cell mixture is semi viscous, it has a lot of advantages. It covers irregular defect easily, does not require periosteal flap thus eliminating the chance of cell leakage and also improving cell distribution [1]-[3]. Moreover, due to viscosity, the surgeon has control over cell implantation in defect region and surgical time is also reduced. This two year follow up study showed good results. Thus, this technique can be used an effective technique to treat cartilage defect [4], [5].

II. MATERIALS AND METHODS

Ten patients treated with gel based autologous chondrocyte implantation from 2011 to 2013, every patient informed consent was obtained, and each hospital ethics committee approval was taken.

We have selected total 10 patients between age group of 25 years to 51 years in which 7 male and 3 female patients were enrolled.

Defect size was ranging from smallest 37 x 5 square centimeter to largest 22 x 25 square centimeters. All defects were ICRS grade IV size. 5 cases had defect on lateral femoral condyle and 5 had defect of medial femoral condyle.

Graft was harvested by arthroscopy from non-weight bearing zone with 6 mm harvester. Graft was collected in tissue harvesting bottle provided by laboratory CRM KIT TM. Using cold chain harvest and graft send to GMP, GCP, and GMP Certified Regenerative Medical Services PVT LTD laboratory at Lonavla, Pune.

At laboratory after receipt of cartilage biopsy specimen, isolation of cells was done through enzymatic digestion using collagenase solution in CRM KIT TM. In 25 cm² tissue culture flask containing DMEM medium with fetal bovine serum in CRM KIT TM, these isolated cells were seeded and were then cultured for 14 days as primary culture. At interval of every 3 days medium was changed in the tissue culture flask throughout entire culture period. These cells were then sub-cultured by trypsinizing, harvesting and plating to fresh tissue culture flasks with a larger surface area, once confluency was reached at specific culture passage.

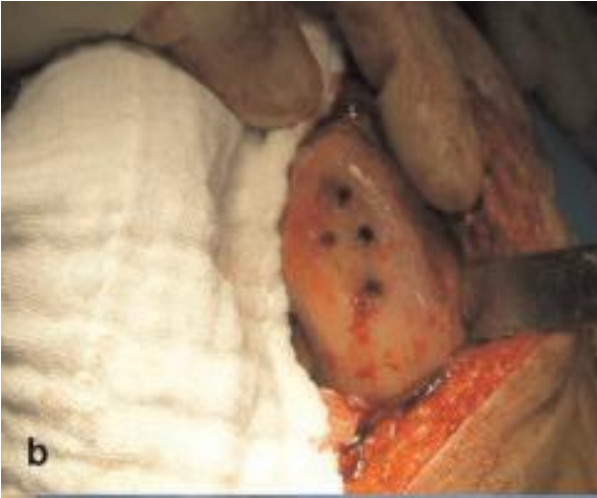
Culture process was of 4 to 5 weeks when a sufficient number of cells were cultured; the cells were harvested and maintained into vials including approximately 12 million cells per vial. After cell culture process is completed, cells are shipped to respected hospital with cold chain with data logger to monitor temperature.

Dr. Shaival Dalal is with the Civil Hospital, India (email: shaival_dalal@yahoo.co.in)

CASE STUDY- CARTIGROW IN RHEUMATOID ARTHRITIS



Pre-op X-ray



Defect



Implantation



Post-op X-ray 1 year

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