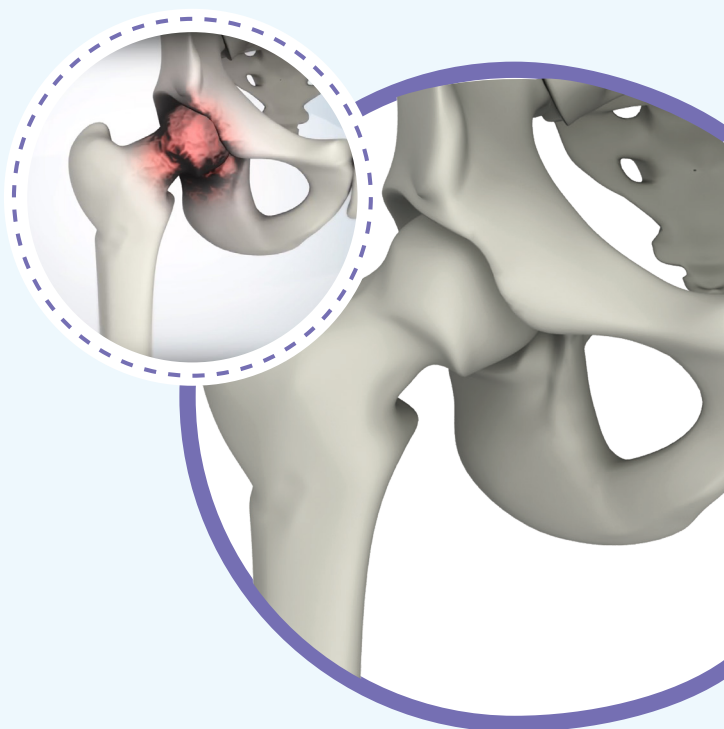


# OSSGROW<sup>®</sup>

## BONE CELL THERAPY FOR AVASCULAR NECROSIS (AVN)



# REGROW<sup>®</sup> YOUR JOINT

**Mere Liye. Mera Apna.**

This brochure describes a procedure for  
treating avascular necrosis of hip joint  
in young adults

Regenerated by  
**REGROW  
BIOSCIENCES<sup>®</sup>**  
Regrow your cells Rebuild your life

# BEING HEALTHY IS A LIFESTYLE




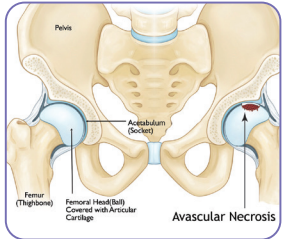
## **Disclaimer:**

The information presented by Regrow Biosciences Pvt. Ltd. is for educational purposes only and does not recommend self-management of health issues. The information should not be treated as comprehensive and does not intend to provide diagnosis, treatment or any medical advice. Individual results may vary and hence, it is advisable to consult your doctor regarding any medical or health related diagnosis or treatment options.

# A. AVASCULAR NECROSIS (AVN)

## What is Avascular Necrosis?

- ◆ **Avascular Necrosis (AVN)** is the localized death of bone tissue.
- ◆ Dead bone tissue does not function normally and leads to complete break-down of the joint.
- ◆ After bone collapse, there is destruction of the cartilage that leads to irreversible arthritic changes and severe pain.
- ◆ The hip joint (ball and socket joint) is the most common joint affected by avascular necrosis, followed by the knee, shoulder, ankle, elbow, and wrist joints.
- ◆ AVN is also referred to as Aseptic Necrosis or Osteonecrosis.
- ◆ Mostly young people 30 - 40 years of age are affected.
- ◆ Male to Female patient ratio is 4:1. 



## Causes & High Risk Factors of AVN



Steroids



Excessive alcohol consumption



Smoking on regular basis



Chemotherapy in cancer patients



Blood disorders like sickle cell anemia



Trauma

Note: In almost 30-40% of patients AVN occurs without any specific reasons

# Common Symptoms of AVN



Stiffness  
in joints



Severe  
immobility



Swelling  
& Infection



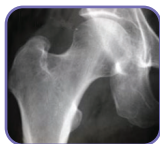
Joint  
deterioration

## Impact of AVN in Daily Life

- ◇ Hip pain starts in the groin region (the area between the abdomen and the upper thigh).
- ◇ The hip joint (ball part) breaks down and gives rise to a limp.
- ◇ Routine activities like sitting, standing, walking becomes painful.
- ◇ Inability to bend forward to wear socks and tie shoelaces.
- ◇ Decline in weight-bearing capacity and full rotation movement of the affected joint.

## Diagnosis

- ◇ By the time pain starts, changes can be observed on X-ray images of the hip joint.
- ◇ **Magnetic Resonance Imaging scan (MRI)** is performed to determine the region and amount of tissue damage including the stage of the disease (Stages 1 - 4 of AVN).
- ◇ Based on your diagnosis, your physician may suggest Bone Cell Therapy



Normal Hip Joint



AVN in Hip Joint




Studies have shown that up to 80% of patients with AVN progress to joint collapse requiring hip replacement within 2 years<sup>1</sup>.

1. Lespasio MJ, Sodhi N, Mont MA. Osteonecrosis of the Hip: A Primer. Perm J. 2019;23:18-100.)

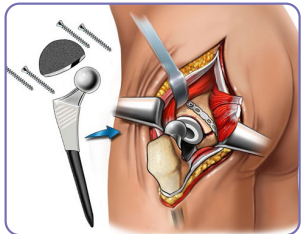
# B. ELIGIBILITY FOR BONE CELL THERAPY

- ◆ The course of treatment will be dependent on three major parameters.

Patient Age and Stage of AVN  
 +  
 Location and Area of necrosis  
 +  
 Deformity associated with injury or fracture (if any)

Stage I	Stage II	Stage III/IV
		
<b>Bone Degeneration Leading To Pain</b>	<b>Bone Degeneration Continues</b>	<b>Bone Collapse Leads To Joint Replacement</b>
✓ OSSGROW®	✓ OSSGROW®	

- ◆ If necrosis reaches Stage IV, the joint is no longer functional and hip replacement is the last option!
- ◆ Life after Total Hip replacement is a complete compromise.



## The artificial implants pose several limitations:



Short life span and needs repeat surgery (7 - 10 years)



Restricts activity & quality of life



Unable to cure disease after spending on surgery



Unable to jog, run or play

# Bone Cell Therapy

- ◆ Cell therapy is a well-accepted mode of treatment in the United States and Europe and is an emerging medical concept in Asia including India.
- ◆ It involves treating a diseased organ or tissue using the patient's own healthy cells.
- ◆ Cell therapy is advised in disease conditions that are chronic lifetime disorders, greatly affect day-to-day life with no known cure in current health care practices.
- ◆ Cell therapy has been proven as a highly successful mode of therapy in tissue and blood-related diseases.



- ◆ The course of treatment will be dependent on three major criteria:



Restart the blood supply



Remove dead bone



Regenerates new bone

# C. BONE CELL THERAPY PROCEDURE

## STEP I

### TISSUE BIOPSY



◆ A simple day-care procedure involving the extraction (biopsy) of a small quantity (4 ml) of your bone marrow will be performed. The procedure usually lasts for 10-15 minutes. The patient is usually given local anesthesia.

- ◆ The bone marrow biopsy is aseptically transported under cold chain (low temperature) to a centralized GMP certified cell culture laboratory. The bone forming cells (osteoblasts) is cultured within 14 - 21 days.
- ◆ During this time, there is complete freedom to perform all activities and attend to your daily schedule.

## STEP II

### BONE CELL IMPLANTATION



- ◆ The necrotic (dead portion) bone is gently removed through a small incision.
- ◆ The cultured cells (millions of cells) are simply implanted into the damaged area of the hip.
- ◆ The implantation procedure usually lasts for about 30 - 45 minutes where, the patient is given spinal or general anesthesia. The Patient returns home in about 2 days of time.
- ◆ Through constantly guided physiotherapy including the muscle strengthening and load bearing capacity exercises, the new bone tissue formed becomes mechanically very robust, allowing all activities as early as 4 - 6 months.

# Rehabilitation Program

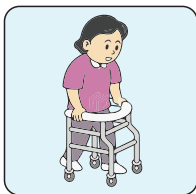
Patient is given home exercises to strengthen the muscles throughout this rehabilitation program

**PHASE I** - To increase motor control and strength by reducing pain, inflammation and swelling and allowing soft tissue healing.



- ◇ Duration: Up to 1 week
- ◇ Gait training on flat surfaces on stairs
- ◇ Complete bed rest

**PHASE II** - To increase functional independence by increasing range of motion & strength



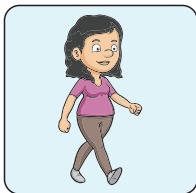
- ◇ Duration: 1 - 3 weeks
- ◇ Partial weight bearing 50% of body weight
- ◇ Activities like weaning from walker to crutches to cane only

**PHASE III** - To increase lower extremity and trunk strength through balance and proprioceptive training (e.g. crossover walk exercise)



- ◇ Duration: 3 - 6 weeks
- ◇ Partial weight bearing 80% of body weight
- ◇ Activities:
  - a. Sit to stand activities
  - b. Lifting and carrying
  - c. Ascending and descending stairs

**PHASE IV** - To increase overall strength throughout lower extremities and become proficient to return to all functional and light recreational activities



- ◇ Duration: 6 - 12 weeks
- ◇ Full weight bearing
- ◇ Exercises:
  - a. Walking
  - b. Swimming

**PHASE V** - Patients are encouraged to return to normal activities including aerobic exercise, cycling, biking, etc.



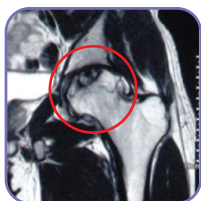
# Success of OSSGROW®

- ◆ Clinical trials in India have proven efficacy of OSSGROW® up to 90%. Most of the treated patients were pain free and did not require other treatments.
- ◆ In all patients, pain and function scores showed significant improvement.
- ◆ X-ray, MRI and CT-scans after treatment showed new bone formation and progression of AVN was arrested in most of the patients.
- ◆ OSSGROW® (Autologous Adult Live Cultured Osteoblasts manufactured by Regrow Biosciences Pvt Ltd), is approved for treatment for Avascular Necrosis of Hip Joint by the Drugs Controller General of India (Central Drugs Standard Control Organization), Ministry of Health and Family Welfare, Govt. of India.



## Clinical Case Studies of OSSGROW®

### Case 1: Patient Age-21/Male

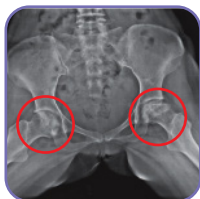


AVN in Left Hip Joint  
(Before OSSGROW®)

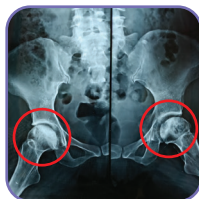


New Bone Formation  
(After OSSGROW®)

### Case 2: Patient Age-29/Female



AVN in both Hip Joints  
(Before OSSGROW®)



New Bone Formation  
(After OSSGROW®)

# Benefits of OSSGROW®

- ◇ Formation of new & healthy (3D) bone with normal structure and function
- ◇ Complete relief from pain
- ◇ All movements, rotation and weight bearing restored
- ◇ No limping and no need of Walker or crutches
- ◇ Your life as well as career is back on track
- ◇ Replacement surgery for life is prevented or delayed

**REGROW YOUR CELLS  
REBUILD YOUR LIFE®**



## WARRIORS AGAINST PAIN



Radhika Baria, Age - 35 years | Copywriter, Mumbai

"At the age of 29 years, I got diagnosed with AVN. I opted for OSSGROW® cell therapy and was able to preserve my hip joint."



Mery George, Age - 63 years | Nurse, Mumbai

"I would not have recovered and got back to my nursing job if it wasn't OSSGROW® which treated my Avascular Necrosis completely."



To watch more testimonials, scan the QR code





# GET BACK TO DOING WHAT YOU LOVE THE MOST

REGROW Therapy® can now be availed under  
Mediclaime/Cashless Policy.

**INSURANCE COVERAGE UNDER  
Government & Private Health Schemes**

**ESIC | CGHS | Private Health Insurance**

✉ info@regrow.in | ☎ 9930896160



**REGROW  
BIOSCIENCES®**  
Regrow your cells Rebuild your life

**REGROW BIOSCIENCES PVT. LTD.**

(Formerly known as Regenerative Medical Services Pvt. Ltd.)  
CIN: U24100MH1989PTC054162

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