

STEM CELL THERAPY: WHAT IRS SHOULD KNOW?

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Introduction:

DO YOU KNOW ANY
KIND OF MEDICATION
TO DO THESE ALL AT
THE SAME TIME?

REGENERATION
EFFECT

Which can even create an ear!



ANTI INFLAMMATORY
EFFECT

Same as cortons!



IMMUNOMODULATORY
EFFECT

Same as Infliximab,
Azathioprine, and
others



Introduction:

DO YOU KNOW ANY
KIND OF MEDICATION
TO DO THESE ALL AT
THE SAME TIME?



HEALTH

5 Chinese children get new ears grown from own cells

CTVNews.ca Staff

Published Tuesday, January 30, 2018 8:10PM EST



London scientists grow noses and ears

April 8, 2014 / 11:05 AM EDT / CBS News



MATT DUNHAM/AP

Introduction:

What are stem cells?

-Stem cells are a category of cells **naturally present in our bodies**, playing a role in partial body repairs and other bodily activities. **Various sources** of stem cells exist in our bodies, including **bone marrow cells**, **fat cells**, cells in the **gums**, **muscle cells**, and **umbilical cord cells**, including Wharton's jelly and umbilical cord blood.



Anti inflammatory effect

Journal of Inflammation Research

An Inflammatory disease

Dovepress

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REVIEW

Stem Cell Therapy in Inflammatory Bowel Disease: A Review of Achievements and Challenges

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~~infliximab~~



Immunomodulatory effect:

Auto immune disease

RENAL FAILURE

2021, VOL. 43, NO. 1, 1266-1275

<https://doi.org/10.1080/0886022X.2021.1968432>



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Taylor & Francis Group

CLINICAL STUDY

OPEN ACCESS



Autologous bone marrow-derived mesenchymal stem cells for interstitial fibrosis and tubular atrophy: a pilot study

~~corrons~~

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Why is stem cell therapy important in (IR)?

Radiologists are the eyes of all other specialists.

Stem cells play a crucial and potentially transformative role in medicine. Therefore, radiologists must have clear vision to facilitate targeted and personalized drug delivery.

Evidence suggests that while systemic stem cell therapy may not be effective, targeted injections of cells are more promising.

Vascular delivery is often the most effective form of targeted therapy.





STEM
CELL

CATHETER

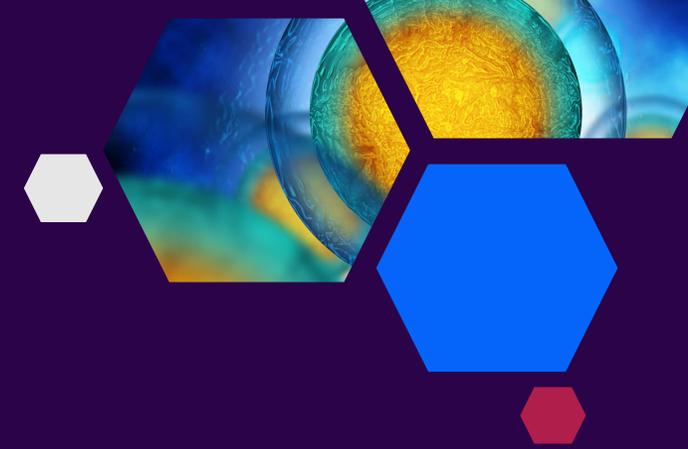
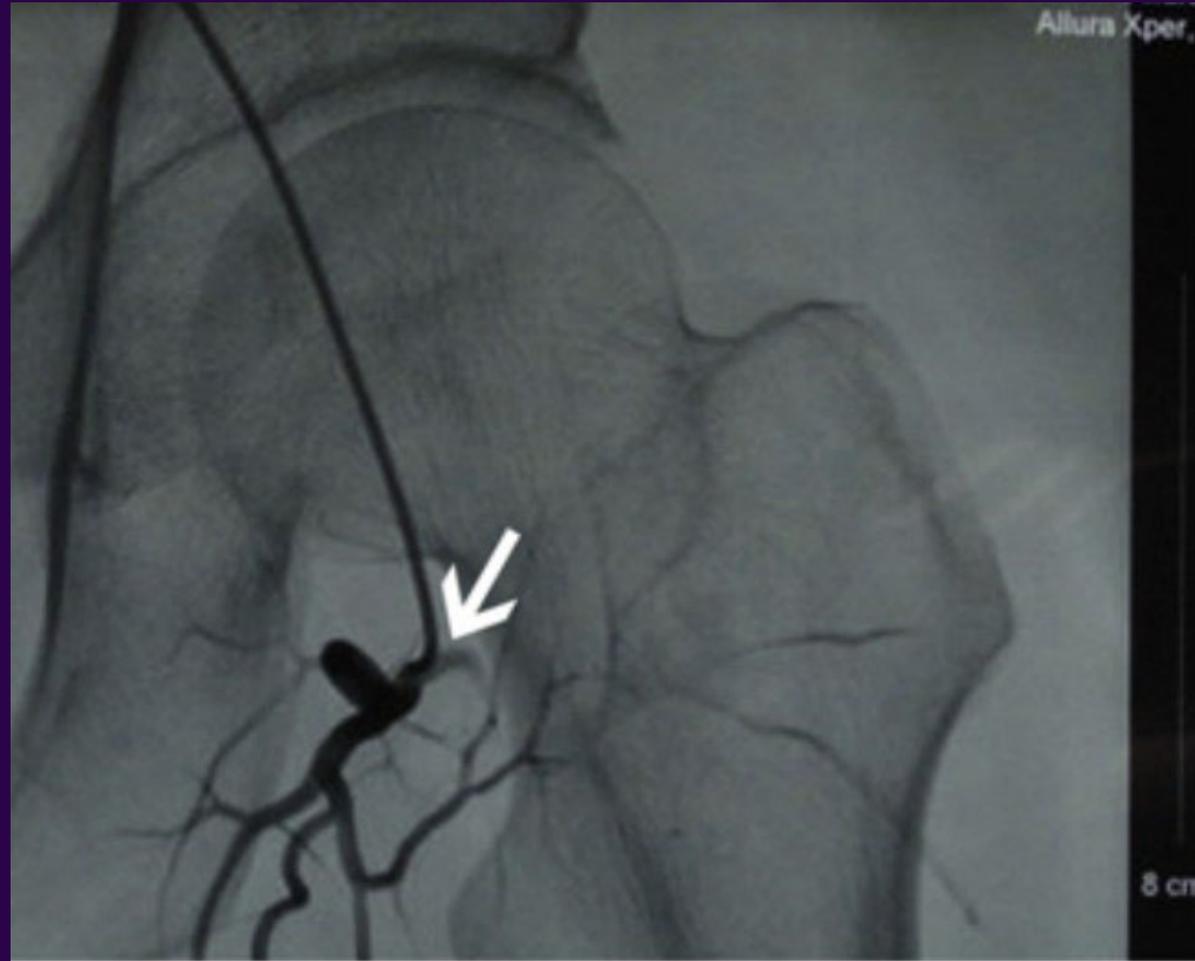
STELL

DISEASE

Interventional
radiologist



Head of femur



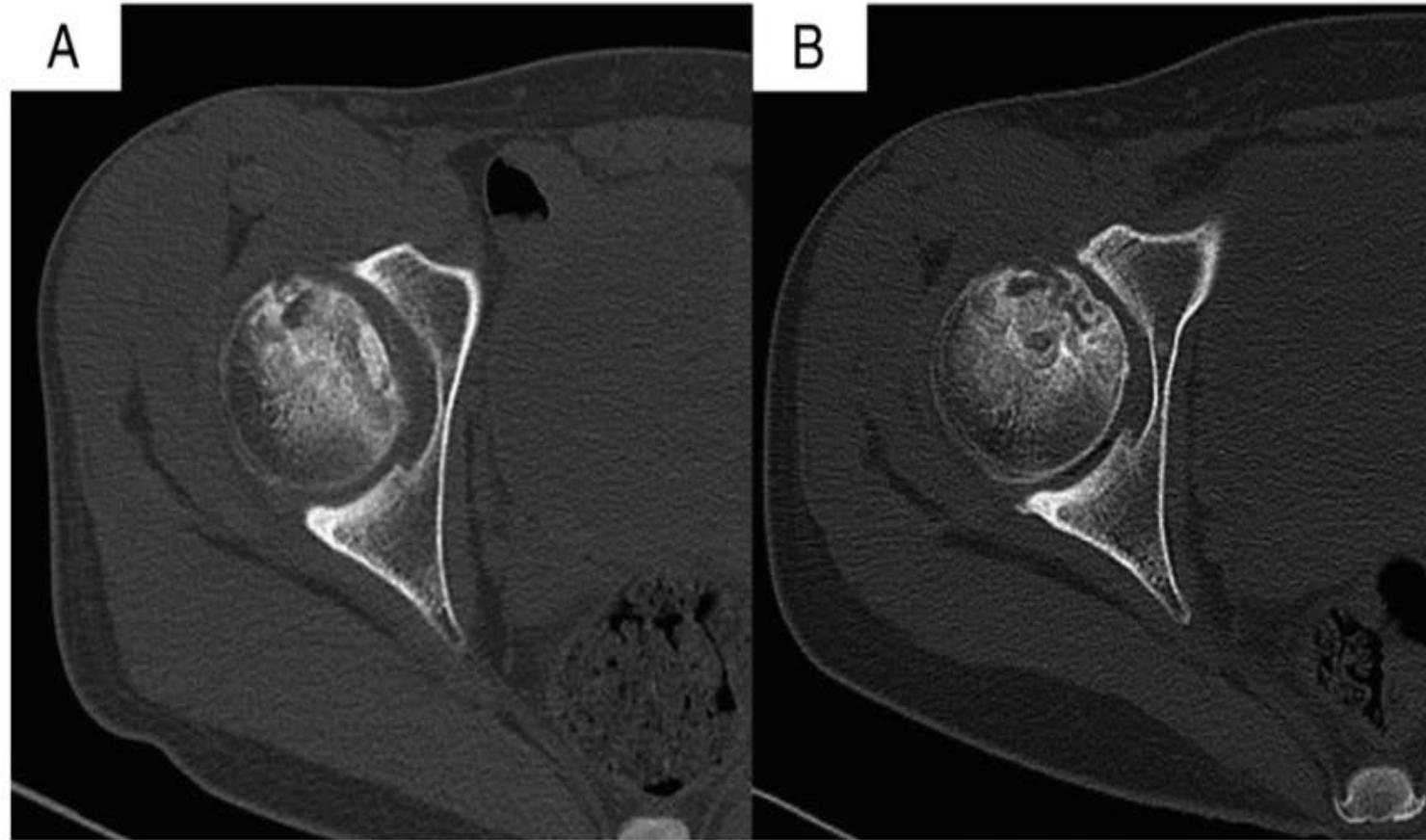
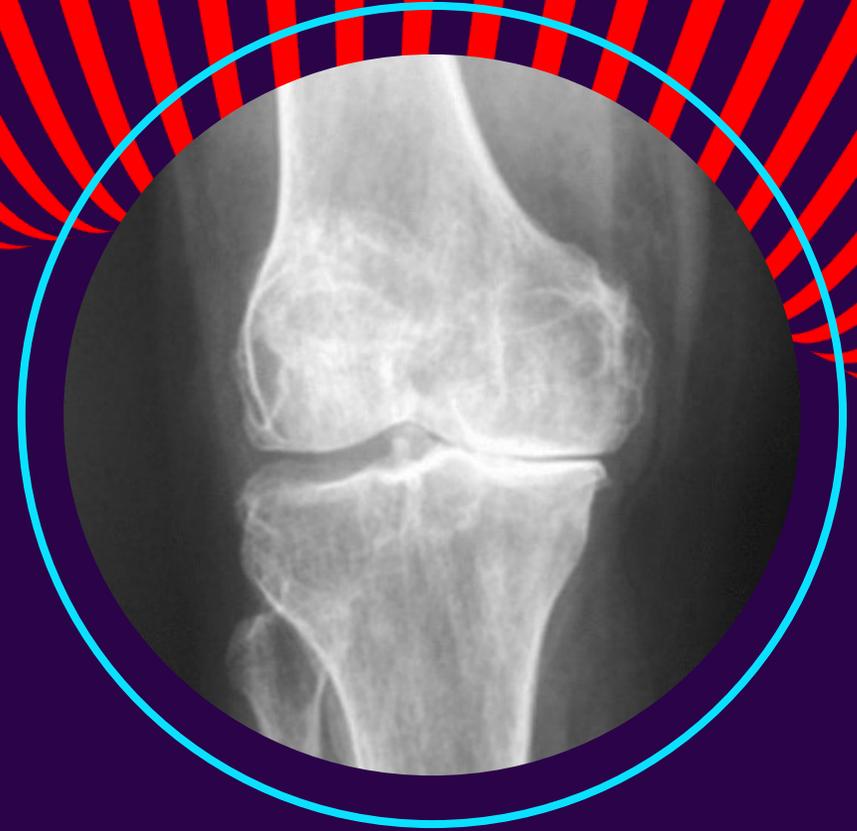


Fig. 7. CT scans at 12 months after treatment show healing in necrotic region of femoral head, and the femoral head remains intact and round. (A) was obtained before the treatment, (B) was obtained at 12 months after the treatment.



ABOUT KNEE OA

- Osteoarthritis disease (OA) , is one of the **most common joint destructive diseases**, which can progress slowly and cause irreparable damage
- 6% of men and 18% of women, who are under the age of 60 are suffering from OA all over the world
- No definite cure** for this disease has been known so far
- In OA, the most common treatment is **medical therapy** for pain control



Stem cell preparation

Umbilical cord (UC) is a rich source of **rapidly proliferating** mesenchymal stem cells (MSCs) that are easily cultured on a large-scale.

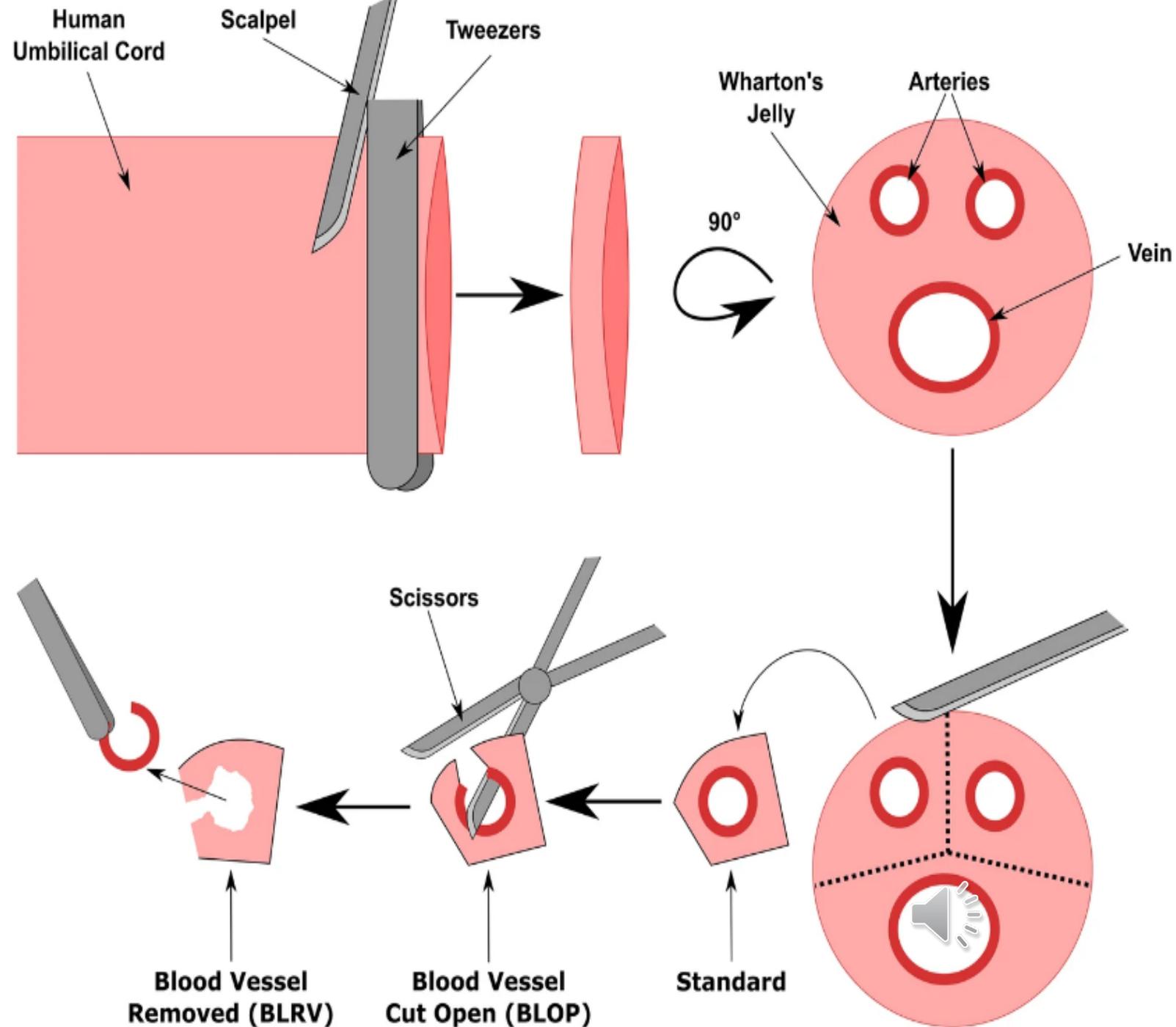
Schematic description for **human umbilical cord** preparation to improve the transduction of MSC-EM-initiating cells.

Tweezers (4 mm) were used to generate uniform slices by transversal dissection of the umbilical cord with a scalpel.

In the second step, the slices were cut between the blood vessels to ensure one blood vessel in each of three pieces (Standard).

One blade of the scissors was pushed into the blood vessel lumen and closed in the orientation that the second blade cut through the surface of the umbilical cord and opened the blood vessel (BLOP).

In the last step, the **blood vessel** was removed entirely by simply pulling out the blood vessel (BLRV).



Inclusion criteria

- ❑ 1) **Symptomatic knee OA:** including people who have **daily pain** which has started at least 3 months before the visit
- ❑ 2) Patients in **mild to moderate stages of OA**
- ❑ 3) **Radiographic changes** should be observed in the specified knee

Exclusion criteria

- ❑ 1) **Intra-articular steroid**, Hyaluronic acid in the knee or Oral steroid during the last 6 months
- ❑ 2) **Local or systemic infection**
- ❑ 3) **Mori deviation** in the form of **valgus** more than 10 or **varus**
- ❑ 4) Simultaneous **ankle** or **hip** pain on the same side
- ❑ 5) Any manifestation of **secondary arthritis**
- ❑ 6) History of **recent malignancy**
- ❑ 7) **Autoimmune diseases**



Material and method:

- out of 500 patients that were screened, **30 patients** (27 women and 3 men, mean age 61-year-old) were included in this study
- The study was accepted by the University **IRB** and Ethic Committee
- We selected the opposite knee as a control group, and initially, their **WOMAC and VAS** scores were similar.
- The **WOMAC** score was recorded **one day prior to the intervention** and at **1, 3, 6, 9** and **12** months post-intervention.
- **MRIs** were performed at **1,6,9,12** months after the procedure.



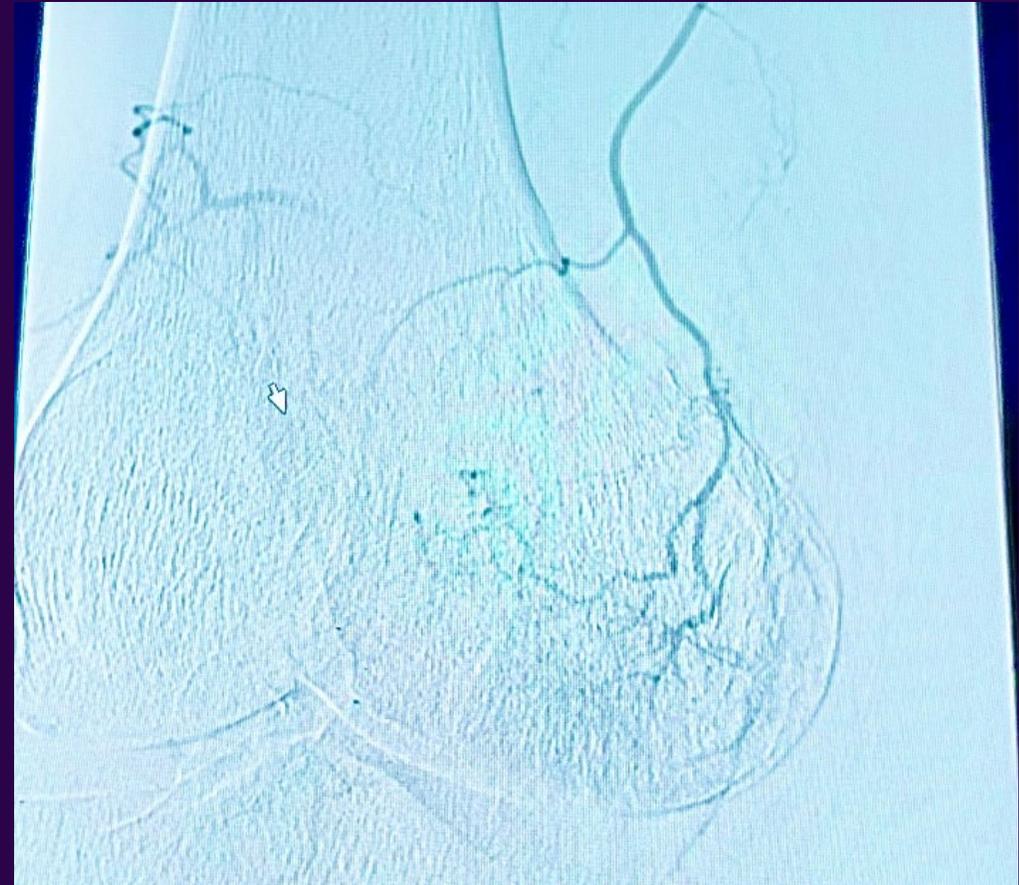
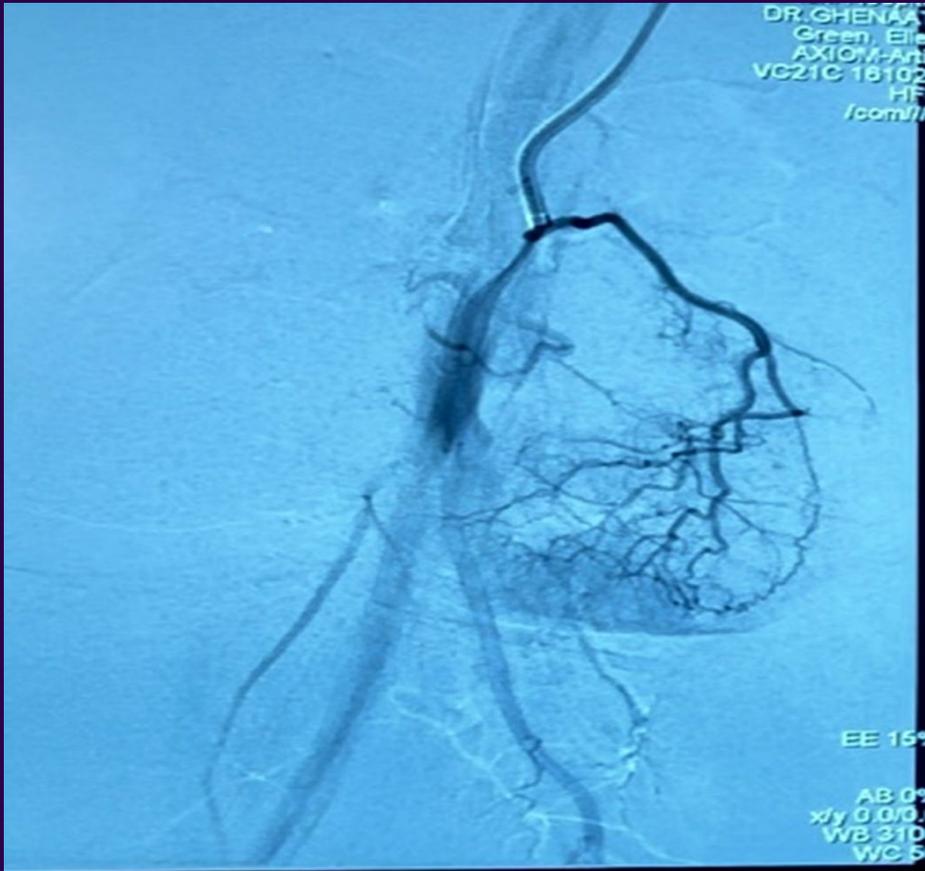
Material and method:

Technique of injection:

- Under Local anesthesia, the **contralateral** common femoral artery was accessed
- Using **JB1**, or **cobra** catheter, the **genicular artery** leading to arterial **blush** were selected
- Then the cells injected slowly
- 5 cc of distilled** water to wash the remain cells form the catheter



Material and method:



Angiographic pictures of the genicular artery and the blush



Material and method:

-Patient were admitted overnight and were all discharged the following day with this order :

RX/

1) **Cephalexin** 500mg q6 hours for 10 days(to prevent infection)

2) **Apixaban** 5 mg BID for 2weeks(to prevent **DVT** because of immobilization)

-Patients were asked to avoid any **heavy activity** for a week



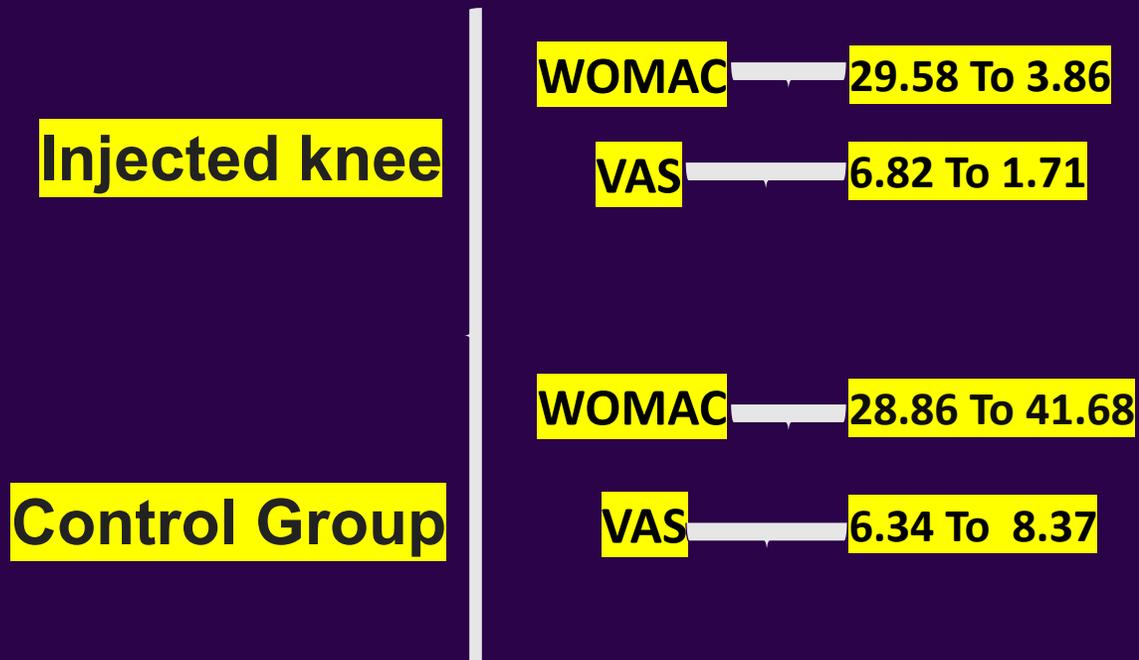
Results:

- Technical success was 100%
- No Immediate major complication
- 2 patients had some self-limited skin discoloration
- All the patients have successfully completed their clinical follow-up as scheduled.
- There was reduction of WOMAC score every 3 months and the most reduction was during the first month



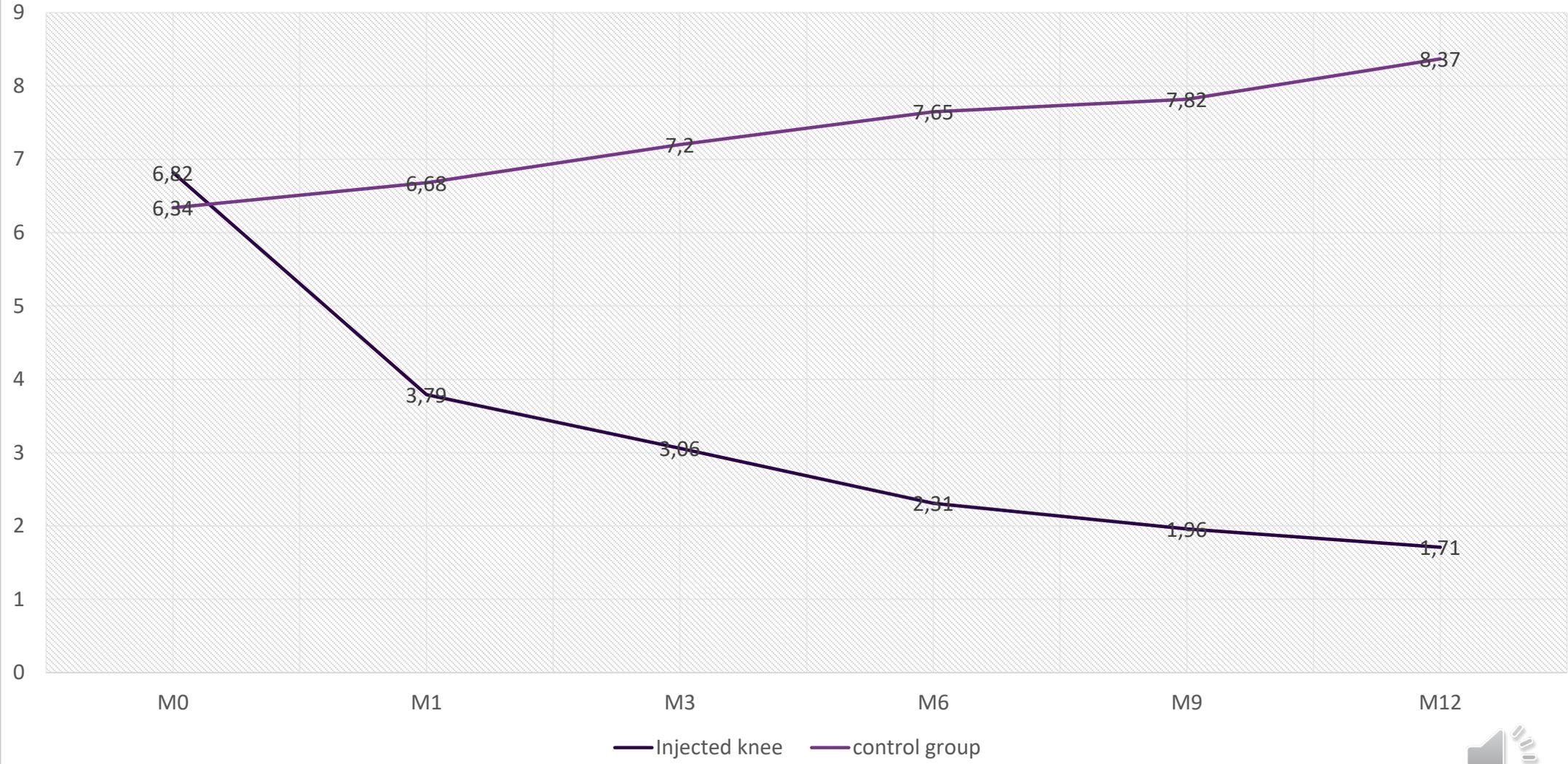
Results:

After 12 months, we observed **significant differences** in the final WOMAC and VAS scores between the two groups!



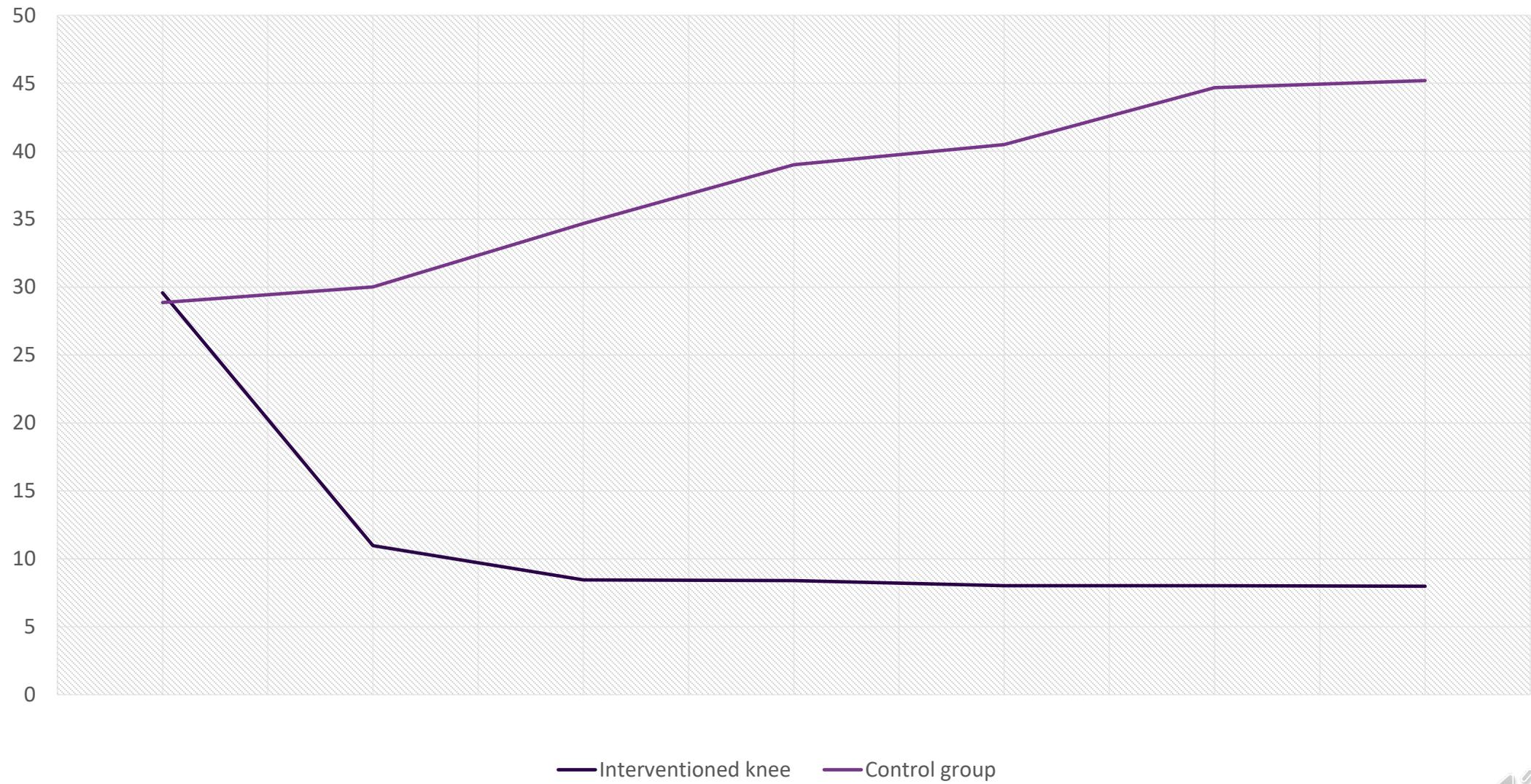
Results:

VAS



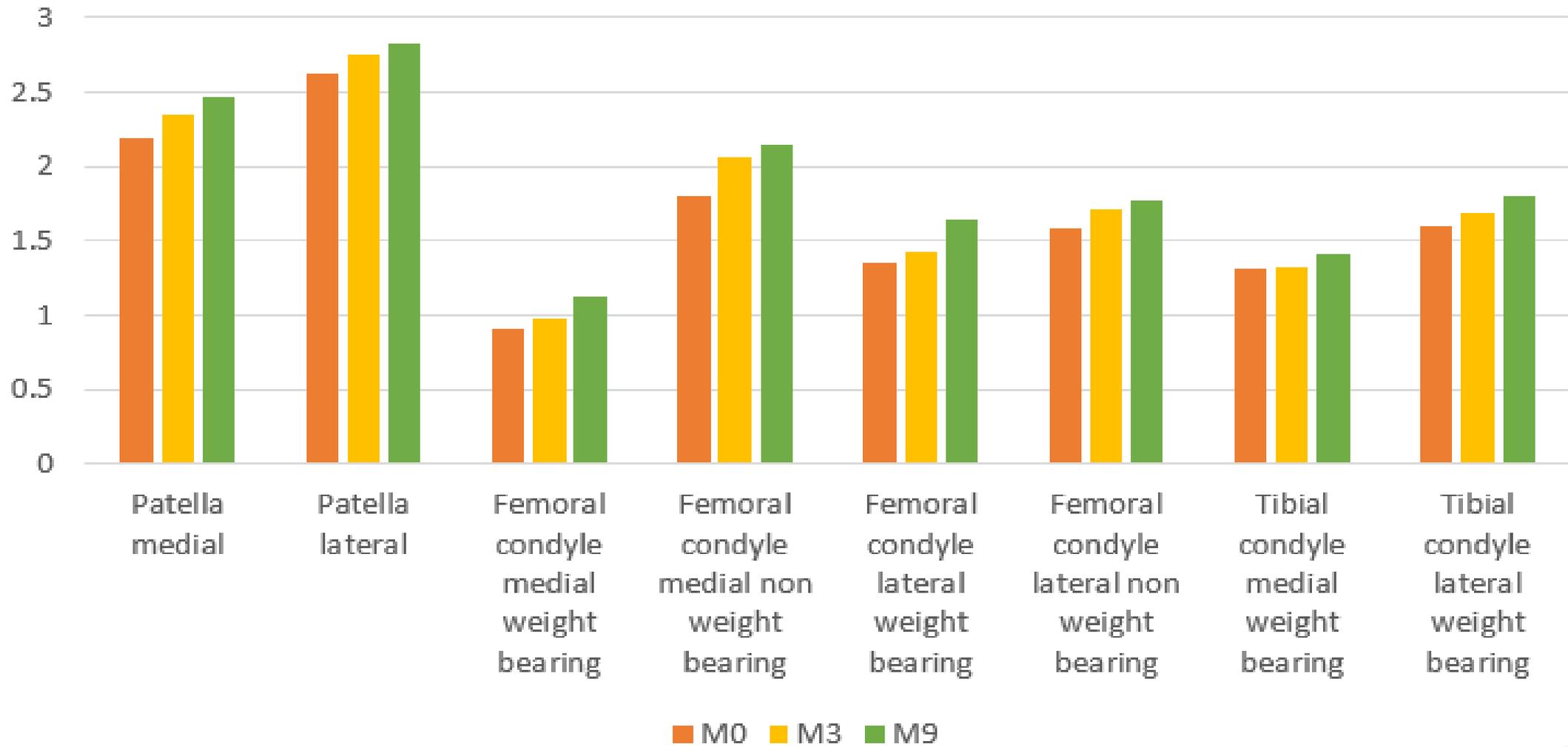
Results:

WOMAC



Results:

Thickness

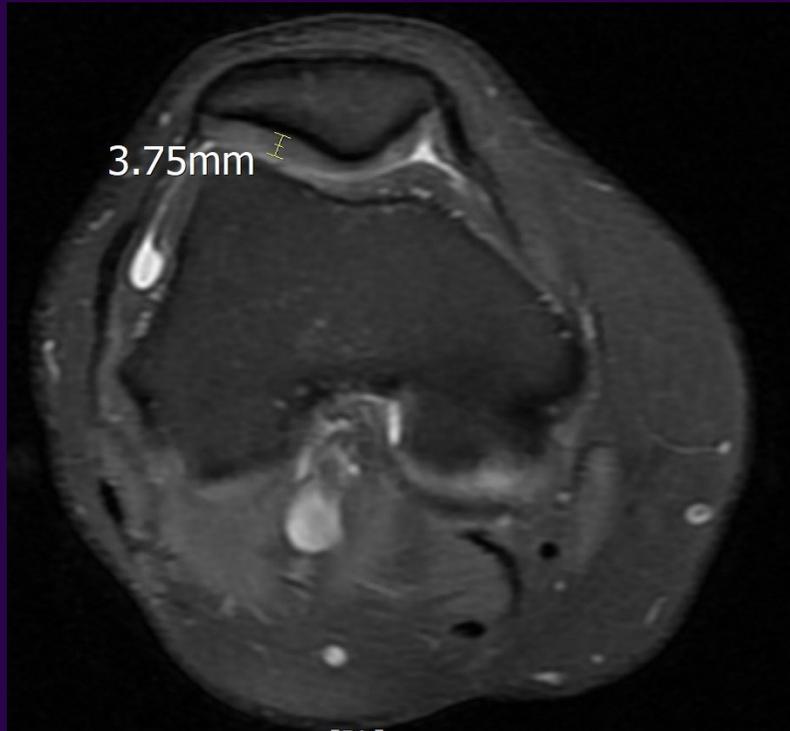


Results:

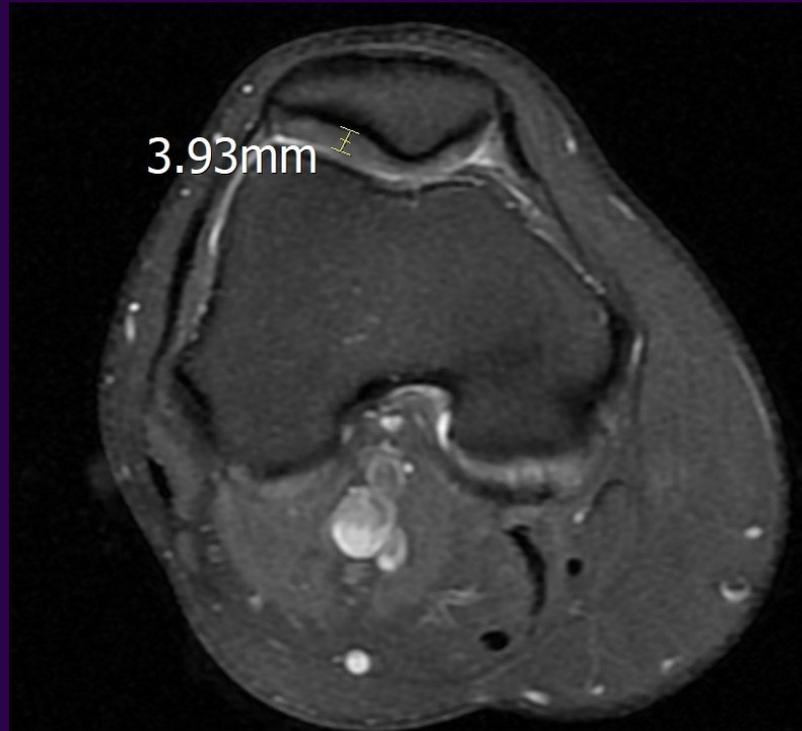
Average size (mm)	M0	M3	M9
Patella medial	2.19125	2.3475	2.4675
Patella lateral	2.6275	2.755	2.81875
Femoral condyle medial weight bearing	0.90125	0.9775	1.12625
Femoral condyle medial non weight bearing	1.8075	2.06	2.1475
Femoral condyle lateral weight bearing	1.36125	1.42125	1.6425
Femoral condyle lateral non weight bearing	1.58875	1.72125	1.77375
Tibial condyle medial weight bearing	1.305	1.31875	1.4075
Tibial condyle lateral weight bearing	1.59875	1.69	1.8075



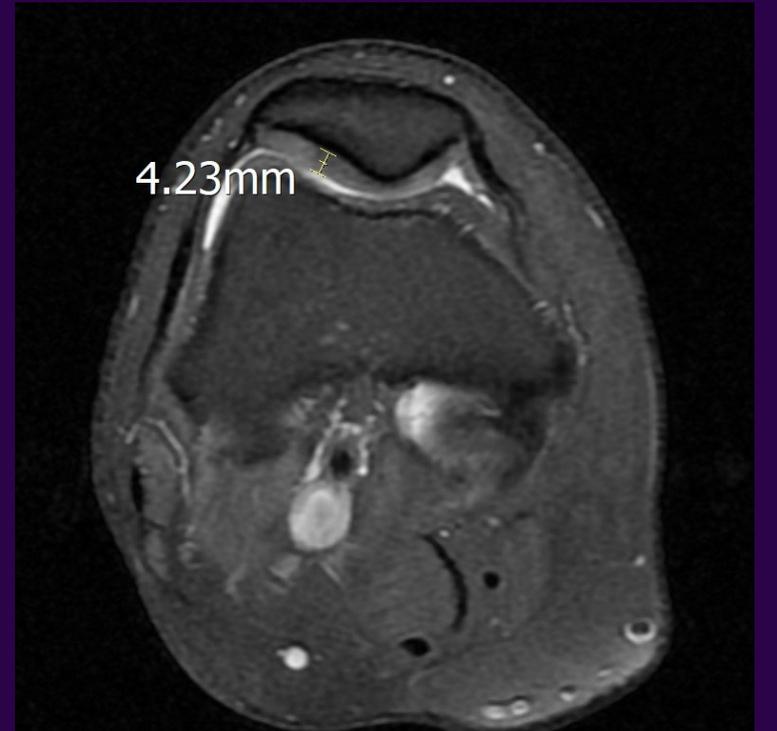
Results:



M0



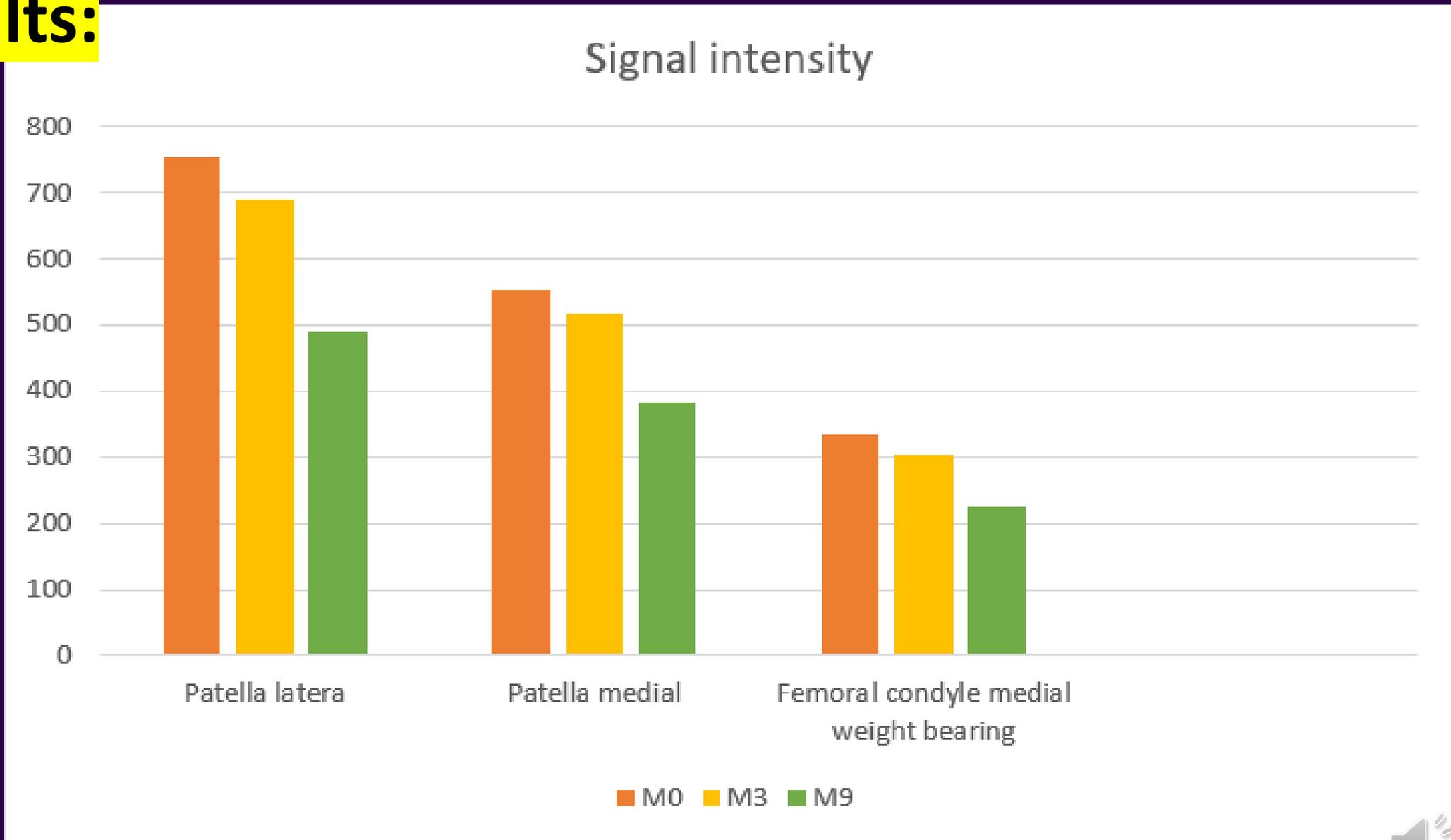
M6



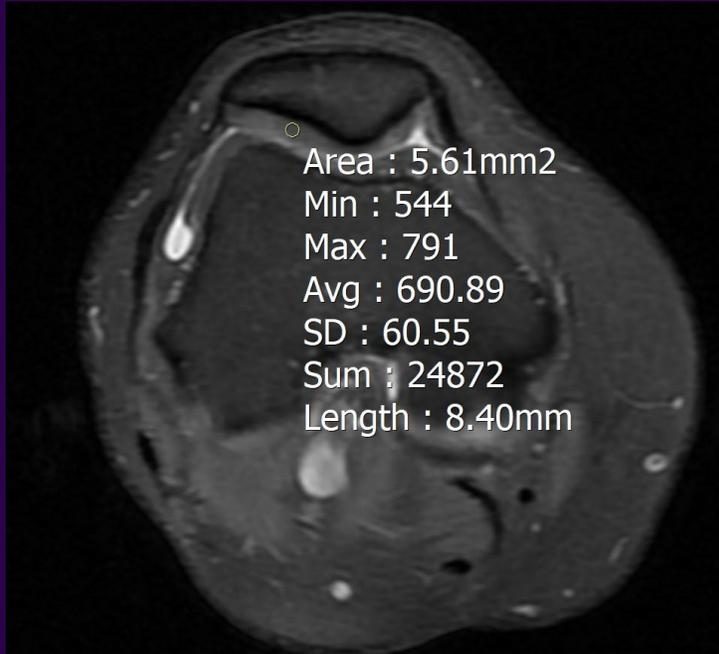
M12



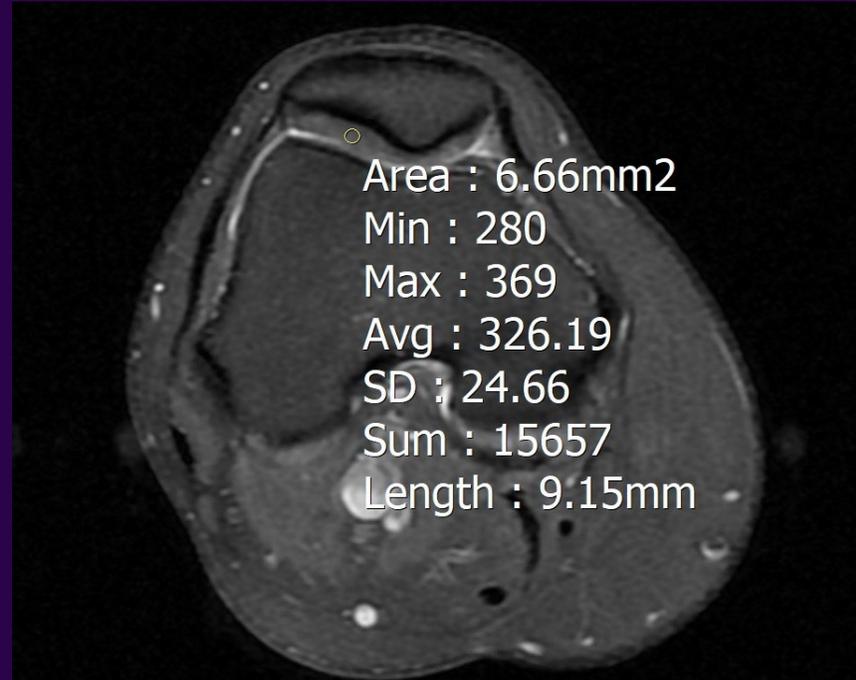
Results:



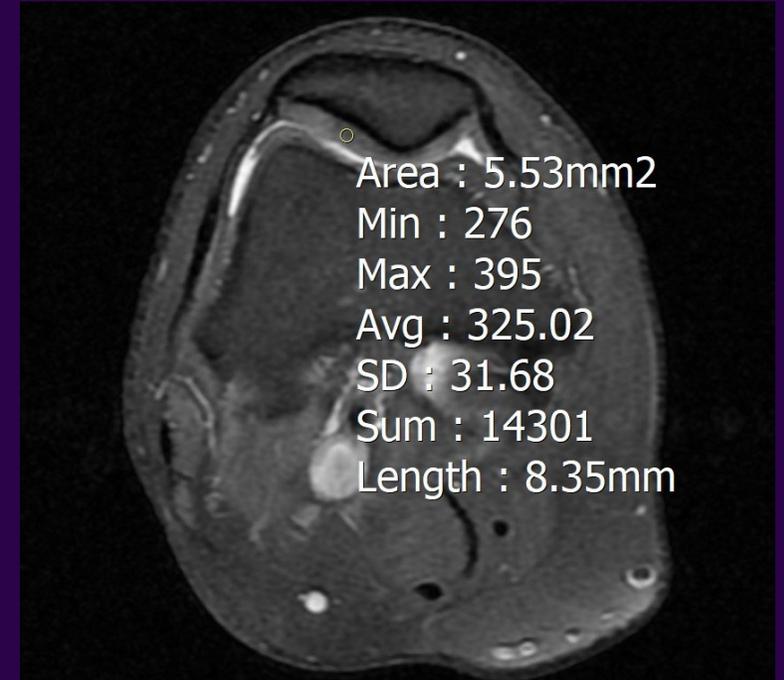
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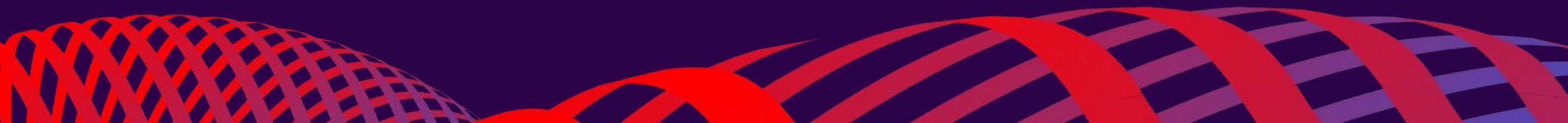
M0



M6



M12



Conclusion:

As the **WOMAC** score clearly indicates a **significant reduction in pain**, along with **notable improvements in all clinical symptoms**, observed in all patients after **12 months**, this procedure can be regarded as a substantial advancement in pain management for patients with knee osteoarthritis (OA).

Cartilage regeneration measured as **0.2mm in 9 months** which shows the potent ability of stem cells to differentiate to other tissues!



Discussion:

What we can confidently state is :
Intra-arterial MSCs injection in
Genicular artery, is

Safe

Effective

And can:

Decrease pain and WOMAC

VAS

Signal intensity

Possibly: Cartilage regeneration

“And also prevent progress of OA”



Thanks for your attention

