

Intraarticular injections with platelet rich plasma for knee osteoarthritis performed in diagnostic-consultative center

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Abstract

Osteoarthritis (OA) is one of the most disabling joint disorders and represents a significant source of discomfort and disability. OA is a chronic, progressive, degenerative disorder that involves the entire joint and presents bone and cartilage impairment that is characterized by subchondral bone structural changes and damage of the protective articular cartilage. More than 10% of the entire population is afflicted by this chronic joint condition. There are two described OA forms: (1) idiopathic, or primary, which could be related to lifestyle factors or aging; and (2) secondary, which could be the consequence of pathological conditions, for example, developmental and/or metabolic disorders, infection, or joint injury. The etiology is not completely clear, but, in addition to age, other risk factors for OA include major trauma, joint overuse, and obesity, which could be largely involved in the progression of knee OA [1].

Received: Nov 02, 2024

Accepted: Dec 03, 2024

Published Online: Dec 10, 2024

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Cite this article: Penev A, Petkov A, Kashilska Y. Intraarticular injections with platelet rich plasma for knee osteoarthritis performed in diagnostic-consultative center. J Clin Med Images Case Rep. 2024; 4(6): 1759.

Keywords: Osteoarthritis; Platelet rich plasma; Oxford knee score.

Abbreviations: OA: Osteoarthritis; PRP: Platelet Rich Plasma; OKS: Oxford Knee Score.

Short commentary

Platelet Rich Plasma (PRP) is an emergent therapeutic approach for the treatment of OA. PRP is an autologous blood product with a high concentration of platelets. PRP's effectiveness is thought to be related to the liberation of growth factors and other molecules, including type I insulin-like growth factor (IGF-I), transforming growth factor (TGF)- β , platelet-derived growth factor (PDGF), and vascular endothelial growth factor (VEGF). The advantages of PRP for the treatment of knee OA are the following: it is easy to use because its preparation is rapid and it is minimally invasive; it is a relatively affordable technique, it is likely to be safe because it is an autologous product [2,3].

There are couple requirements referred to the patient before the intraarticular application of the PRP: 3 days before the application

Drink at least 3 litres of water per day.

Usage of alcoholic fluids is prohibited.

Eating of fried foods and fat meals is prohibited.

Those requirements are related to the easier extraction of the PRP from the blood.

In our practice we use 8 ml test tubes for the blood extraction. Different preparation methods for PRP can yield products with different compositions and characteristics. (1) The double-

spinning method/3000 rounds per minutes for 12 minutes/, that yields a four to eight fold change in platelet concentration over baseline levels and also concentrates leucocytes; (2) The single-spinning method/3500 rounds per minutes for 18 minutes/, that yields a one- to three fold change in platelet concentration over baseline levels. The application of the PRP should be done no more than 30 minutes after the end of the extraction, because after that time the activity and the quantity of the platelets are decreasing significantly. For the application we use 22 G needle 5 to 8 cm long. The application is made by lateral parapatellar access in a flexed knee position. In our medical center we perform triple doses of intra-articular PRP (2 weeks apart in repeat injections).

For evaluating the results from the PRP procedure we use the Oxford Knee Score (OKS):

During the past 4 weeks...

(1) How would you describe the pain you usually have in your knee?.

None
Mild
Very mild
Moderate
Severe

(2) Have you had any trouble washing and drying yourself (all over) because of your knee?.

No trouble at all
Very little trouble
Moderate trouble
Extreme difficulty
Impossible to do so

(3) Have you had any trouble getting in and out of the car or using public transport because of your knee? (With or without a stick).

No trouble at all
Very little trouble
Moderate trouble
Extreme difficulty
Impossible to do so

(4) For how long are you able to walk before the pain in your knee becomes severe? (With or without a stick)

No pain or for more than 30 minutes
16 - 30 minutes
5 - 15 minutes
Around the house only
Not at all - severe on walking

(5) After a meal (sat at a table), how painful has it been for you to stand up from a chair because of your knee?

Not at all painful
Slightly painful
Moderately painful
Very painful
Unbearable

(6) Have you been limping when walking, because of your knee?

Rarely/Never
Sometimes or just at first
Often, not just at first

Most of the time
All of the time

(7) Could you kneel down and get up again afterwards?

Yes, easily
With little difficulty
With moderate difficulty
With extreme difficulty
No, impossible

(8) Are you troubled by pain in your knee at night in bed?

Not at all
Only one or two nights
Some nights
Most nights
Every night

(9) How much has pain from your knee interfered with your usual work? (including housework)

Not at all
A little bit
Moderately
Greatly
Totally

(10) Have you felt that your knee might suddenly give way or let you down?

Rarely/Never
Sometimes or just at first
Often, not at first
Most of the time
All the time

(11) Could you do household shopping on your own?

Yes, easily
With little difficulty
With moderate difficulty
With extreme difficulty
No, impossible

(12) Could you walk down a flight of stairs?

Yes, easily
With little difficulty
With moderate difficulty
With extreme difficulty
No, impossible.

A score of 0 to 19 may indicate severe knee arthritis. It is highly likely that you may well require some form of surgical intervention.

A score of 20 to 29 may indicate moderate to severe knee arthritis. You may require an assessment and x-ray.

A score of 30 to 39 may indicate mild to moderate knee arthritis. Your GP may suggest that you have an assessment and possible x-ray. You may benefit from non-surgical treatment, such as exercise, weight loss, and /or anti-inflammatory medication.

A score of 40 to 48 may indicate satisfactory joint function.

We have studied 45 patients (24 men and 21 women, mean age 46.4 years) with follow up to 1 year after the intervention and evaluation of the OKS at the start, 1 month, 3 months, 6

months and 1 year after the application of the PRP.

The average OKS at the start: 27.5.

One month after application OKS: 28.8.

Three months after application OKS: 29.7.

Six months after application OKS: 30.5.

One year after application OKS: 32.

Conclusions

PRP is a blood product that allows in a simple, low cost, and minimally invasive way to obtain a concentration of many of growth factors and biologically active molecules and its use is associated with reduced inflammation, pain relief, improved function, and possible cartilage regeneration, that may delay the development of the Osteoarthritis of the knee and further operation for Knee endoprosthesis.

References

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