

**Evaluation of the results of treatment with the use of platelet-rich blood plasma
in large joints**

Asilova S.U.

professor, d.m.s. Department of Traumatology and Orthopedics, VPH and
neurosurgery Tashkent Medical Academy, Tashkent, Uzbekistan

Abdullaev M.M.

Assistant of the Department of Traumatology and Orthopedics VPH and
neurosurgery TMA, Tashkent, Uzbekistan

Abdurakhimov S.N.

Multidisciplinary traumatologist-orthopedist clinics of the center for advanced
training of medical workers, Tashkent, Uzbekistan

Khamraev Sh.F.

Master of the Department of Traumatology and Orthopedics, VPH and neurosurgery
of the Tashkent Medical Academy, Tashkent, Uzbekistan

Abstract: The article presents an analysis for the last 6 months of our work at the Department of Traumatology and Orthopedics of the TMA for 2020. At the Department of Traumatology and Orthopedics of the Tashkent Medical Academy and at the Department of Traumatology and Orthopedics of the Multidisciplinary Clinic of the Center for the Development of Professional Qualifications of Medical Workers and on an outpatient basis at the Family doctor's clinic, platelet-rich plasma (PRP) was used in 65 patients, 15 of them with coxarthrosis and 50 with gonarthrosis. Application of platelet-rich plasma in large joints after treatment in 88% of patients with coxarthrosis and 89% with gonarthrosis received good and very good treatment results. The duration of remission increased for at least 6 months.

Keywords: coxarthrosis, gonarthrosis, platelet-rich plasma, autohemoplasmotherapy.

Introduction: Osteoarthritis of large joints in patients over 60 years old occurs from 8% to 40%, these figures averaged 33.6% [26]. According to the WHO, osteoarthritis of large joints occurs in men on average in 9.6%, in women in 18% [7, 8, 10, 12, 17]. In Europe, in people from 40 to 80 years old with pathology of large joints, osteoarthritis of large joints occurs from 22% to 55% and is considered the main cause of disability [13]. Pain is the primary clinical symptom of osteoarthritis of large joints, which does not allow patients to lead an active lifestyle. In patients, the pain increases while walking, especially when going downstairs. On palpation in the area of the hip and knee joints along the joint space, starting from the medial to lateral sections, patients notice pain, from a slight 1-2 stages of arthrosis, to intolerable expressed at 3-4 stages [2, 21].

Currently, the existing methods of treating patients with arthrosis of large joints often do not lead to the desired results. At the same time, there are no safe methods of pain control and highly effective treatment methods [16, 20, 24, 28, 29]. In patients with hip and knee osteoarthritis in the early stages, intra-articular hyaluronic acid preparations are used to reduce pain and improve joint function [7, 8, 18, 19, 35]. For periods of up to 6 months, among modern methods of treatment, the use of platelet-rich plasma (PRP) is currently very promising [10, 11, 14, 15, 31, 34]. Platelet-rich plasma (PRP) contains alpha granules of platelets with growth factor, which are gradually released into the surrounding tissues and improve the regeneration and reparative process at the site of inflammation [17, 18, 22, 23, 27, 30, 33]. After the introduction of PRP, the maximum effect is achieved to relieve inflammation, improve regeneration, stimulate local immunity and increase local blood supply [1, 3, 4, 5, 6, 9, 25, 32, 36]. The data obtained after the introduction of platelet-rich plasma (PRP) is ambiguous in its judgment, depending on the stage of the disease.

Objective: The aim of the study was to study the results of treatment in patients with stage 1–2 osteoarthritis of large joints by intra-articular injection of platelet-rich plasma (PRP).

Materials and research methods: according to our observations, from February to July 2020, 65 patients with osteoarthritis of large joints were in the department of traumatology and orthopedics of the multidisciplinary clinic of the center for the development of professional qualifications of medical workers and on an outpatient basis at the clinic "Family doctor's" from February to July 2020. Of these, 20 men and 45 women. At the age of 30-45 years 5 (8%) patients, from 46-55 years 8 (12%) patients, from 56-65 years 17 (26%) patients and from 66 - more than 35 years (54%) patients. All 65 patients (15 patients with coxarthrosis and 50 with gonarthrosis) received platelet-rich plasma (PRP) according to our developed method. Patients underwent MRI, ultrasound, Doppler and X-ray examination. Long-term results were studied in 62 patients, 14 of them with coxarthrosis and 48 with gonarthrosis for three main symptoms: pain, mobility, and walking of the patient. The average follow-up period with long-term results is 1.5 years. Evaluation of treatment results was carried out according to the U. Oberg scale.

These signs were divided into 3 categories: they were rated at 11 and 12 points each. Evaluation of results can be carried out in two ways, in terms of absolute or relative indicators. We have evaluated the absolute values of the sum of points scored by patients before and after treatment of large joints.

To assess the functional state of patients before and after treatment with platelet-rich plasma (PRP), the characteristics of pain were assessed according to 7 criteria (from 0 to 6 in increasing order, that is, from the absence of pain - 11-12 points, to pronounced and permanent - 0 points).

- the degree of mobility of the hip and knee joints was assessed normally over 90 degrees, with abduction up to 30 degrees - 11-12 points, before ankylosis in a vicious position - 0 points.

- assessment of the state of walking was assessed from 11-12 points, when the patient could not walk - 0 points.

- summing up the scores for the parameters - pain, mobility, walking, the results of the functional state of the hip and knee joints were assessed.

The result of the sum of points 11–12 was assessed by us as very good, 10 points - good; 9 points - average; 8 points - mediocre; 7 or less points is bad.

Table 1

The severity of pain syndrome in patients with OA of the hip and knee joints before and after treatment

The nature of the pain	The severity of the pain syndrome in points						Standard value of points
	Patients with coxarthrosis		Patients with gonarthrosis		Total		
	Before treatment 15	After treatment 14	Before treatment 50	After treatment 48	Before treatment 65	After treatment 62	
No pain							11-12
easy or infrequent pain, normal activity	2 (13%)	4 (29%)	5 (10%)	12 (25%)	7 (11%)	16 (26%)	9
slight pain while walking, quickly disappears during rest	4 (27%)	3 (21%)	10 (20%)	15 (31%)	14 (22%)	18 (29%)	7
tolerable pain limiting activity	3 (20%)	4 (29%)	13 (26%)	12 (25%)	16(24,5%)	16 (26%)	5
severe pain while walking, excluding any activity	3 (20%)	3 (21%)	13 (26%)	9 (19%)	16 (24.5%)	12 (19%)	3
severe pain	2 (13%)	-	7 (14%)	-	9 (14%)	-	1

even at night							
severe and persistent pain	1 (7%)	-	2 (4%)	-	3 (4%)	-	-
Total	15 (100%)	14 (100%)	50 (100%)	48 (100%)	65 (100%)	62 (100%)	
Average score	7,2	10,8	7,5	10,2			

As can be seen from the table, after treatment with coxarthrosis out of 14 patients was noted; in 4 patients - mild or rare pain, normal activity; in 3 patients - slight pain while walking, quickly disappears during rest; in 4 patients - tolerable pain limiting activity; 3 patients have severe pain while walking, excluding any activity. Severe nocturnal pain, severe and persistent pain was not observed.

After the treatment of patients with gonarthrosis, out of 48 patients it was noted: in 12 patients - pain that occurs easily or rarely, normal activity; in 15 patients - slight pain while walking, quickly disappears during rest; 12 patients have tolerable pain limiting activity; 9 patients have severe pain while walking, excluding any activity. Severe nocturnal pain, severe and persistent pain was not observed.

We also studied the degree of mobility of the hip joint in the observed patients after autohemoplasmotherapy.

Table 2

The degree of mobility in patients with OA of the hip and knee joints before and after treatment

Degree of mobility	The degree of mobility of large joints in points						
	With coxarthrosis		With gonarthrosis		Total		Standard value of points
	Before treatment 15	After treatment 14	Before treatment 50	After treatment 48	Before treatment 65	After treatment 62	
flexion: more	2	4	7 (14%)	14	9	18	11

than 90 degrees, abduction: up to 30 degrees	(13%)	(29%)		(29%)	(14%)	(29%)	
flexion: 80 - 90 degrees, abduction: less than 15 degrees	5 (33%)	4 (29%)	17 (34%)	22 (46%)	22 (34%)	26 (42%)	9
flexion: 60 - 80 degrees the patient can reach the foot	4 (27%)	3 (21%)	14 (28%)	7 (15%)	18 (28%)	10 (16%)	7
flexion: 40 - 60 degrees	4 (27%)	3 (21%)	9 (18%)	4 (8%)	13 (20%)	7 (11%)	5
flexion less than 40 degrees	-	-	3 (6%)	1 (2%)	3 (4%)	1 (2%)	3
no movement, slight deformation	-	-		-		-	
Total	15 (100%)	14 (100%)	50 (100%)	48 (100%)	65 (100%)	62 (100%)	-
Average score	7,3	9,0	7,1	9,2			

The table shows that after treatment with coxarthrosis out of 14 patients was noted: in 4 patients flexion: more than 90 degrees, abduction: up to 30 degrees; in 4 patients, flexion: 80 - 90 degrees, abduction: less than 15 degrees; in 3 patients, flexion: 60 - 80 degrees, the patient can reach the foot; in 3 patients flexion: 40 - 60 degrees. Flexion less than 40 degrees is a slight deformation and with ankylosis in a vicious position was not.

After treatment with gonarthrosis, out of 48 patients it was noted: in 14 patients, flexion more than 90 degrees, abduction up to 30 degrees; in 22 patients, flexion 80 - 90 degrees, abduction less than 15 degrees; in 7 patients, flexion 60 - 80 degrees, the patient can reach the foot; in 4 patients, flexion of 40 - 60 degrees, in 1 patient, flexion of less than 40 degrees, active movements are absent, slight deformation. Ankylosis was not observed in a vicious position.

The degree of restoration of the function of the affected joint was also judged by walking.

Table 3

Assessment of the state of walking in patients with OA of the hip and knee joints before and after treatment

Walking condition	Assessment of the state of walking in points						Standard value of points
	С коксартрозом		С гонартрозом		Total		
	Before treatment 15	After treatment 14	Before treatment 50	After treatment 48	Before treatment 65	After treatment 62	
normal	1 (6.6%)	3 (21%)	4 (8%)	6 (13%)	5 (7%)	9 (15%)	11
without a cane, but there is a slight limp	6 (40%)	5 (36%)	20 (40%)	23 (48%)	26 (40%)	28 (45%)	9
with a cane - can walk for a long time, for a short time - without a cane and limping	4 (27%)	4 (29%)	18 (36%)	17 (35%)	22 (34%)	21 (34%)	7
using one cane for less than 1 hour; difficult - without a cane	1 (6.6%)	1 (7%)	6 (12%)	1 (2%)	7 (11%)	2 (3%)	4
with canes only	2 (13.2%)	1 (7%)	1 (2%)	1 (2%)	3 (5%)	2 (3%)	3
only with crutches	1 (6.6%)	-	1 (2%)	-	2 (3%)	-	2
can't walk	-	-	-	-	-	-	0

Total	15 (100%)	14 (100%)	50 (100%)	48 (100%)	65 (100%)	62 (100%)	-
Average score	7,4	9,8	7,9	10,2			-

The table shows that after treatment with coxarthrosis, out of 15 patients it was noted: in 1 patient, walking returned to normal; 6 patients walked without a cane, but with slight limp; 4 patients with a cane can walk for a long time, for a short time without a cane and lame; 1 patient using one cane for less than 1 hour, difficult - without a cane; 2 patients with a cane only; 1 patient with crutches only. Patients who could not walk were not observed.

After treatment with gonarthrosis, out of 50 patients it was noted: in 4 patients, walking returned to normal; 20 patients walked without a cane, but with slight limp; 18 patients with a cane can walk for a long time, for a short time without a cane and lame; 6 patients with one cane less than 1 hour, difficult - without a cane; in 1 patient only with a cane; and only 1 patient walked with crutches. There were no patients who could not walk.

Before treatment, all observed patients had pain, limitation of mobility and walking of varying severity. After treatment, joint pain gradually decreases and the mobility of the joints, walking improves, which indicates the effectiveness of the use of platelet-rich plasma in coxarthrosis and gonarthrosis.

We have evaluated the results of treatment after the use of platelet-rich plasma for coxarthrosis and gonarthrosis in the nearest future according to the U. Oberg scale.

Table 4

Evaluation of the results of treatment after the use of platelet-rich plasma for coxarthrosis and gonarthrosis in the near future according to the U. Oberg scale

Assessment (score)	With coxarthrosis	With gonarthrosis	Number of patients
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Very good (11-12)	5 (33%)	20 (40%)	25 (39%)
Good (10)	8 (53%)	24 (48%)	32 (49%)
Medium (9)	1 (7%)	5 (10%)	6 (9%)
Unsatisfactory (7 or less)	1 (7 %)	1 (2%)	2 (3%)
Total	15 (100%)	50 (100%)	65(100%)
Average value 9-9.5			

Example of a patient: Patient RA 66 years old with a diagnosis of osteoarthritis of the knee joint on the left of grade 2 before treatment there was tolerable pain, limiting activity, flexion in the knee joint 60–80 degrees; the patient can reach the foot using one cane for less than 1 hour; with difficulty - walked without a cane. After treatment, there is easy or rare pain, normal activity; flexion: more than 90 degrees, abduction: up to 30 degrees; walked normally. The mean score was 7.6 before treatment, after treatment became 9.8.

Good and very good results were considered if there were no pains in the joints when walking and at rest, the range of motion of the joints increased and signs of active inflammation were increased. In 88% of patients with coxarthrosis and 89% with gonarthrosis after treatment, good and very good treatment results were obtained. The duration of remission increased for at least 6 months. In 7% of patients, unsatisfactory results were observed with grade IV osteoarthritis, which required surgical treatment, i.e. endorotheses of large joints.

Conclusions:

1. The use of platelet-rich plasma is a modern, effective and promising method of treatment.
2. Application of platelet-rich plasma in large joints after treatment in 88% of patients with coxarthrosis and 89% with gonoarthrosis received good and very good treatment results. The duration of remission increased for at least 6 months.

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