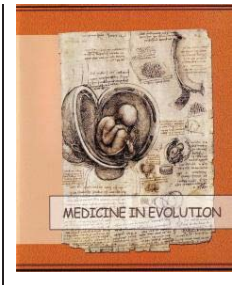


Associated Protein Rich Plasma (PRP) technique in traumatic meniscus tear and cartilage lesion



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Abstract

The most common acute knee disorders in the emergency department are cartilage and meniscus injuries, anterior cruciate ligament tears and MCL elongations. But even more important is that most of these lesions occur in the active population, both physically and socially, therefore the socio-economic impact of these diseases is huge. Beside the classic treatment methods, lately a new adjuvant procedure brings favorable results: Protein Rich Plasma. PRP is a relatively new technique, introduced around 2000 in orthopedics and traumatology practice, but generally accepted after 2010. It is based on the ability to repair of the growth factors stored in blood platelets. We will analyze the follow-up patients with meniscal and cartilaginous lesions, the treatment options and their association, as well as the evolution with or without treatment.

Keywords: meniscus tears, cartilage lesion, protein rich plasma, orthobiologic treatment

INTRODUCTION

Knee joint injuries are the most common presentations in emergency services worldwide in active patients aged 21-55 years. In the USA alone, this type of presentation remains represented by a number of 660K patients / year (2012, Bret E. Gage et co. In Academic Emergency Medicine). Over time, the therapeutic conduct has been adapted to a better understanding of the pathophysiology, biomechanics of the knee joint and new therapeutic discoveries. At present, the therapy applied 20 years ago is no longer relevant, which means an adaptation of the all trauma centers to the general trend of treatment.

Studies show that women are more likely to suffer knee injuries compared to men, with some studies advancing 2-8% more than men. This is related to decreased muscle balance between the quadriceps and the Hamestring complex, increased levels of estrogen and relaxin, including even certain anatomical differences, such as increased pelvic width in women.

An adequate treatment is considered the one after which, the well-being returns, the mobility is the one before the trauma, and the integration of the patient in the ecomic and social life is complete. This is not easy to obtain and is usually the result of a combination of treatments.

It should also be taken into account that most of these patients are active people, prolonged immobilizations or long-term treatments that decrease muscle mass are not preferred.

MATERIAL AND METHODS

A number of 45 patients between May 2019- May 2020, who suffered acute injuries of the knee joint, meniscus or cartilage lesion or a combinations of this types of injuries. Patients with ACL and MCL lesions were excluded. The suspected diagnosis in the emergency room was confirmed or refuted by MRI, performed in an imaging center with a 1.5 Tesla device. The ratio women per men was 1.1 / 0.9, and the average age was 39 years.

After clinical and imaging evaluation, it was observed that some patients had combinations of the 2 types of lesions and not just single lesions. Therefore a third group of patients was considered.

At the end the 3 groups of patients were divided differently:

21 patients with meniscal injuries

8 patients with cartilaginous lesions in various degrees

16 patients with combined lesions

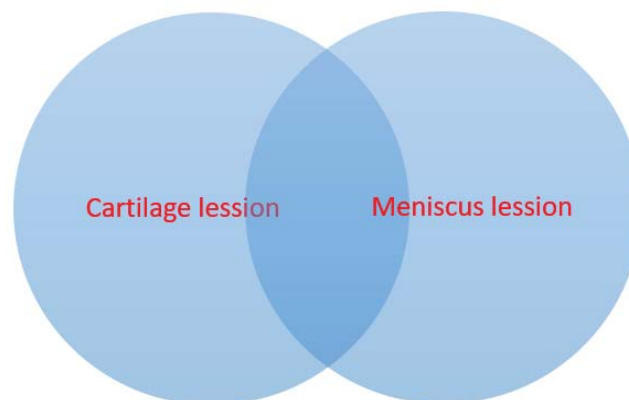


Figure 1. Type of lesion

Type of treatment:

- Surgical: partial arthroscopic meniscectomy - for bucket handle meniscal lesions
- PRP: for cartilaginous lesions less than 1 cm and for degenerative, radial or longitudinal meniscal lesions
- Combined. applied for traumatic meniscal injuries with surgical treatment in which cartilaginous lesions have been identified intraoperatively.

Partial arthroscopic meniscectomy was performed only on patients with bucket handle meniscal tear. We really believe in the importance of the meniscus and its influence on the biomechanics of the knee. Moreover, the recommendations of the latest studies recommend a great precaution for meniscectomy, the lack of the meniscus being a predisposing factor for secondary osteoarthritis. At the same time, it has been proven that approximately 70% of the adult population has meniscal lesions that do not show clinical manifestations.

Some of our patients in the study treated surgically also discovered to had cartilaginous lesions. When these lesions were deep enough and affected the subchondral bone, limited chondroplasty was performed in the affected area.

PRP procedure involves the body's ability to self-repair capacity by using growth factors stored in platelets. Being a procedure that uses the body's healing capacity, the quality of the blood used is very important. Therefore, the patients in our study were educated that 5 days before performing the procedure to avoid NSAIDs, have a very good body hydration and avoid fatty foods. Harvesting was done using 10 ml specimens, and the product resulting from centrifugation was 5 ml, with a growth factor concentration of 5-6 X compared to normal blood concentration. After infiltration patients were advised to avoid drugs or local procedures that inhibit inflammation.

Combined procedures, first partial arthroscopic meniscectomy and PRP therapy procedures was performed after 30 days from surgery.

Table I. Type of lesion

Lesion	Meniscal lesion	Cartilage lesion	Combined lesion
Patients no	21	8	16
Total	45		

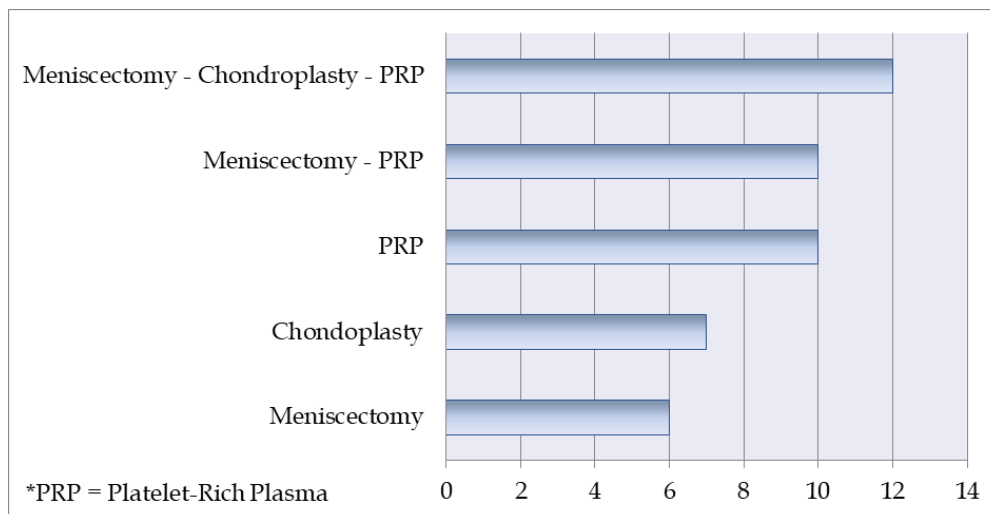


Figure 2. Procedures

RESULTS

For a correct evaluation of the knee, we use functional orthopedic scores (Lysholm and WOMAC) associated with the patient's individual perception of mobility and knee function at the end of treatment.

In case of patients with partial arthroscopic meniscectomy, we noted great results in 85% of cases, with a good degree of patient satisfaction, associated with improved mobility, decreased pain and local edema at approximately 30 days postoperatively.

For patients with meniscal lesion and conservative treatment represented by of PRP technique as the single method of treatment, the degree of satisfaction was approximately 40% overall. The pain decreased by about 60% but the discomfort continued at 30 days post-therapy especially in case of large movements, also mobility was improved by about 50% and there was a decrease in local edema but not completely.

In case of patients with chondral defects less than 1 cm for whom the treatment was decided by the PRP technique as a treatment, the results were exceptional in proportion of 90%. In these patients, mobility increased considerably and the pain almost became non-existent after 30 days. Resumption of activity at high intensity was allowed 45 days after the last infiltration. In the 10% in which the result was satisfactory, it was considered that probably the lesions detected on MRI investigation were much more extensive than initially thought.

In the case of patients with meniscal lesions for whom partial arthroscopic meniscectomy was performed and intraoperatively cartilaginous lesions less than 1 cm were discovered, it was decided that postoperatively at 30 days to be used as additional treatment 3 infiltrations with PRP at a distance of 10 days. Following the evaluation, it was observed that the general degree of satisfaction was 75%, in most cases the patients resumed their active life, achieving approximately performances similar to the situation before the trauma.

DISCUSSIONS

Meniscal injuries caused by trauma are a cause of joint discomfort with secondary decrease in regular physical activity. The indication for partial surgical resection must remain reserved for these types of lesions, being recommended their preservation if this is possible (small radial and longitudinal lesions). The use of the PRP technique as an associated therapy, brings an additional clinically proven benefit. For cases in which only the conservative treatment of meniscal lesions is decided, it should be mentioned that the best results are obtained with a subsequent joint reeducation program secondary to PRP injection. However, if the result obtained only by PRP treatment, without surgery, is not satisfactory, partial arthroscopic meniscectomy should be considered.

Cartilaginous lesions respond very well to PRP therapy, especially in cases of defects less than 1 cm without severe damage to the subchondral bone.

CONCLUSIONS

The use of intraarticular PRP injections brings a definite benefit to traumatic injuries following arthroscopic surgical treatment or as a single therapy. In order for a great results, a well-documented selection and treatment of patients must be made. It should not be considered that one of the procedures replaces the other, the best results are obtained when for each specific injury a singular or associated treatment is decided, depending on the specificity of the trauma and the particularity of the case.

We recommend using the PRP injection technique for minor meniscal lesions, for cartilaginous defects under 1 cm and in which the subchondral bone is not affected. For major meniscal lesions associated or not with superficial cartilage lesions, we recommend

arthroscopic meniscectomy, chondroplasty, followed by additional PRP after 30 days from surgery, as well as joint reeducation after 10 days to the last infiltration.

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