Novel Techniques in Arthritis & Bone Research
ISSN: 2575-8888

Juniper Publishers
key to the Researchers

Short Communication
Volume 3 Issue 2 - July 2018
DOI: 10.19080/NTAB.2018.03.555606

Nov Tech Arthritis Bone Res

The Clinical Efficacy of Injectable Platelet Rich Fibrin in the Treatment of Degenerative Temporomandibular Joint Disease

Anand Amirthraj*

Department of Oral and Maxillofacial Surgery, Manipal College of Dental Sciences, India

Submission: July 11, 2018; **Published:** June 17, 2018

***Corresponding author:** Anand Amirthraj, Department of Oral and Maxillofacial Surgery, Manipal College of Dental Sciences, Mangalore, India, Email: anand.raj@manipal.edu

Short Communication

A degenerative disorder involving the temporomandibular joint is characterized by deterioration of articular tissue with concomitant osseous changes in the condyle and/or articular eminence. It is sub-classified as: degenerative joint disease without arthralgia or osteoarthrosis and degenerative joint disease with arthralgia or osteoarthritis [1]. The free radicals and cytokines (interleukin-1b and tumor necrosis factor alpha) released tend to activate protease receptors which further leads to cartilage fibrillation and erosion, osteophyte formation and sclerosis of subchondral bone. Advanced degeneration manifests through flattening of the condyle, joint protuberances, erosion, and disc perforation [2].

The degenerative joint disease of temporomandibular joint shows signs and symptoms like pain, stiffness, joint clicking, crepitation and the limitation of movement. Presently, remedies for joint diseases have focused on alleviating the functional pain and establishing normal range of mandibular motion. Various non-invasive methods are used in the treatment of degenerative joint diseases like occlusal splints, supportive physical therapy procedures, rehabilitation involving muscular training, and psychological support, to relieve symptoms [3]. If the symptoms persist and the severity of the degeneration is greater, minimally invasive treatments may be applied, such as lavage, intra-articular injections of hyaluronic acid, chondroitinsulphate and corticosteroids, arthrocentesis, and arthroscopy [4,5].

Current research is exploring newer methods to stimulate repair or replacement of damaged cartilage, such as matrix metalloproteinase inhibitor, gene therapy, cytokine inhibitor, artificial cartilage substitute and growth factors [6]. Autologous Concentrated Platelets is a natural concentrate of growth factors (Platelet derived growth factor, transforming growth factor ß, vascular endothelial growth factor), endostatins, platelet factor 4, angiopoietins and thrombospondin. Thus the activated platelets when injected reduces inflammation, provide pain relief, improve function and stimulate possible cartilage regeneration at the site of injury [7,8]. Analgesic properties of platelets are due to release of protease activated receptor 4 peptides [9].

Many researchers referred the high efficacy of platelet-rich plasma in the management of temporomandibular disorders and its safety as autologous material [6,10,11]. One of the drawbacks of PRP is the additional use of anti-coagulants, known to delay wound healing. Further, a second-generation platelet concentrates termed platelet rich fibrin (PRF) was developed to improve wound healing in comparison to PRP. Standard PRF contains a 3-dimensional fibrin matrix following centrifugation, however this is not ideal for injections as it is cumbersome to handle. A pioneer development of the low speed centrifugation method introduced the concept of injectable PRF (i-PRF), a liquid formulation of PRF without using anticoagulants [12-14]. It maintains a liquid viscosity for roughly 15 minutes following centrifugation and interestingly can be injected in a similar method to PRP yet bears the added advantage of forming a fibrin clot shortly after injection. Also the recent study demonstrated the ability of i-PRF to release higher concentrations of various growth factors and to induce higher fibroblast migration and expression of PDGF, TGF-β, and collagen1 when compared to PRP [14] thus provide a better environment for the regeneration and repair of the defects.

References

1. Peck CC, Goulet J, Lobbezoo F, Schiffman EL (2014) Oral Rehabilitation Expanding the taxonomy of the diagnostic criteria for temporomandibular disorders (1): 2-23.
2. Machoň V, Řehořová M, Šedý J, Foltán R (2013) Platelet-Rich Plasma in Temporomandibular Joint Osteoarthritis Therapy 2(2): 2-5.
3. Manfredini d, Marini M, Pavan M, Pavan l, Guarda-nardini l (2009) Psychosocial profiles of painful TMD patients. J Oral Rehabil 36(3): 193-198.
4. Dolwick MF (1997) The role of temporomandibular joint surgery in the treatment of patients with internal derangement. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 83(1): 150-155.

5. Nitzan DW, Price A (2001) The use of arthrocentesis for the treatment of osteoarthritic temporomandibular joints. J Oral Maxillofac Surg 59(10): 1154-1159.

6. Sharma SM, Thakar D (2014) The Clinical Efficacy of Autologous Concentrated Platelets in Treatment of Tmj Disorders - a pilot study 4(3): 70-74.

7. Lana JFSD, Andrade Santana MH, Dias Belangero W, Malheiros Luzo AC, Springer-Verlag GmbH (2013) Platelet-Rich Plasma Regenerative Medicine: Sports Medicine, Orthopedic, and Recovery of Musculoskeletal Injuries.

8. Anitua E (2018) Plasma rich in growth factors: preliminary results of use in the preparation of future sites for implants. Int J Oral Maxillofac Implants 14(4): 529-535.

9. Asfaha S, Cenac N, Houle S, Altier C, Papez MD, et al. (2007) Protease-activated receptor-4: a novel mechanism of inflammatory pain modulation. Br J Pharmacol 150(2): 176-185.

10. Hassan EF, Ali TM, Abdulla NS (2016) The Clinical Efficiency of Platelet Rich Plasma in the Treatment of Temporomandibular Joint Disorders 41: 226-231.

11. Pihut M, Szuta M, Ferendiuk E, Ze DN (2014) Evaluation of Pain Regression in Patients with Temporomandibular Dysfunction Treated by Intra-Articular Platelet-Rich Plasma Injections: A Preliminary Report.

12. Choukroun J, Ghanaati S (2018) Reduction of relative centrifugation force within injectable platelet-rich-fibrin (PRF) concentrates advances patients' own inflammatory cells, platelets and growth factors: the first introduction to the low speed centrifugation concept. Eur J Trauma Emerg Surg 44(1): 87-95.

13. El Bagdadi K, Kubesch A, Yu X, Al-Maawi S, Orlowska A, et al. (2017) Reduction of relative centrifugal forces increases growth factor release within solid platelet-rich-fibrin (PRF)-based matrices: a proof of concept of LSCC (low speed centrifugation concept).

14. Miron RJ, Fujioka-kobayashi M, Hernandez M (2017) Injectable platelet rich fibrin (i-PRF): opportunities in regenerative dentistry ? Clin Oral Investig 21(8): 2619-2627.

DOI: 10.19080/NTAB.2018.03.555606

How to cite this article: Anand A. The Clinical Efficacy of Injectable Platelet Rich Fibrin in the Treatment of Degenerative Temporomandibular Joint Disease. Nov Tech Arthritis Bone Res. 2018; 3(1): 555606. DOI: 10.19080/NTAB.2018.03.555606