From "Orthopaedic Surgery" to "Orthopaedic Needling."

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Knee Osteoarthritis affects millions of people around the world. Although joint replacement for end stage osteoarthritis improves the quality of life of many it is expensive and some people may not be satisfied with this procedure. However, concerns regarding conservative treatment of patients with early- to end-stage osteoarthritis is mounting. The usual conservative treatment options available for early- to moderate-stage osteoarthritis are anti-inflammatory drugs, steroids and hyaluronic acid injections, Ozone and prolotherapy. Evidence suggests that all such treatment have their own merit and demerits and none is safe in the long term. Due to potential side effects of the available treatment options, it is believed that regenerative medicine (stem cells and platelet rich plasma) can be a good alternative with better long-term outcome and minimal side effects for all stages of osteoarthritis. Regenerative medicine is the new treatment on the horizon that promises to enhances the healing process of damaged tissues and organs with or without the need of surgery and has better efficacy and safety profile.

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Platelet Rich Plasma (PRP) has 3 to 5 times greater concentration of platelets compared to baseline.[1] For preparing PRP a sample of approximately 12 to 15 millilitre of blood is withdrawn from patient's vein and then centrifuged with either single or double spin method. This usually provides 4 to 6ml of PRP. [2] It is known that high level of platelet aggregates contains growth factors within alpha granules that provide the stimulus for healing and repair mechanism.[3] Since 2008 numerous studies have been published regarding its safety and efficacy in osteoarthritis and they all have found it to be better than hyaluronic acid and steroid injections.[4] There is no consensus regarding the number of sessions required for knee osteoarthritis but studies suggest that 2 to 3 sessions at 1 to 2 weeks apart provide best results.[5] PRP is found to improve knee function on all assessment scales when compared with other conservative measures including steroid injection, hyaluronic acid injection, prolotherapy, and ozone therapy at 6 to 12-month follow-ups for early- to moderate-stage osteoarthritis.[6] The National Institute for Health and Clinical Excellence(NICE) guideline 2019 declared PRP for knee osteoarthritis as safe and effective for early- to moderate-stage osteoarthritis but has advised further research with more randomized controlled trials.[5]

Stem cells or more precisely adult mesenchymal stem cells (AMSCs) are used aggressively in regenerative medicine due to their ability to form new cell lines that help to replace damaged cells.[7] One study found stem cell treatment better than other conservative therapies for grade 1 to 3 Osteoarthritis knees after 2 years of follow-up.[8] It is reasonable to assume that in future, more patients will be offered treatment with MSCs for knee Osteoarthritis.[7] A more recent study concluded that autologous stem cell treatment for knee osteoarthritis provides better efficacy and safety in all stages of osteoarthritis in the long term.[8] Although use of stem cells in repair and regeneration has been tried a lot, the results are not consistent from one study to another. Moreover, the right cell source is still debatable. Further research is required to establish best tissue-derived stem cells, its usage and ideal dose for the treatment of osteoarthritis. [8]

The evidence of safety and efficacy is increasing in the literature for the use of stem cells and platelet-rich plasma (PRP) for knee osteoarthritis. These modalities have been performing well for early to moderate osteoarthritis when compared to other treatment options in the short-and long-term follow-ups. There are many commercially available kits for the preparation of PRP. Although they are relatively cost effective but less invasive than stem cell treatment. With growing evidence, it is safe to assume that the future is promising and the potential

of "Orthopaedic Surgery" to "Orthopaedic Needling" is not far.

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