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Case Report

IS SUSTAINED NATURAL APOPHYSEAL GLIDES COMBINED WITH CONVENTIONAL PHYSIOTHERAPY EFFECTIVE FOR PATIENTS WITH FACET JOINT SYNDROME? – A CASE SERIES

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ABSTRACT

Background: Chronic back pain has been the nemesis of the human race since the time they evolved and began walking on their two legs; leaving aside the 4 limb locomotion of their predecessors. Varied are the causes of low back ache and facet joint syndrome is one amongst them. Hence this study was undertaken to find out the effectiveness of SNAGS and conventional physiotherapy in patients with lumbar facet joint syndrome. **Purpose**: To describe the management and outcomes of 4 patients with lumbar facet joint syndrome treated with Sustained Natural apophyseal glides (SNAGs), Therapeutic Ultrasound and lumbar stabilization exercises. **Study Design :** A case series of consecutive patients with Lumbar facet syndrome **Case Description:** Four consecutive patients (mean age 52 years) who presented with lumbar facet syndrome were treated with two weeks protocol which included Sustained Natural apophyseal glides, Therapeutic Ultrasound (Cont. 1-MHz , 2.0-W/cm^2, 10min) and lumbar stabilization exercises. Follow up was taken 1 week after the end of active intervention. All patients completed Visual analogue Scale (VAS), Modified Oswestery Disability Questionnaire (MODQ), Sorensen Test hold Timing and spinal Range of motion on initial assessment, immediately at the end of active intervention (2 weeks) and at the end of follow up. **Outcome:** All four patients showed the mean percentage change in score of VAS 49.87 %, MODQ 61.14 %, Sorensen test scores 19.63 %, Flexion range 9.21 % and extend range 17.07 % at the end of follow up. **Conclusion:** All four patients with Lumbar facet joint syndrome treated with sustained natural apophyseal glides (SNAGS), Therapeutic Ultrasound and lumbar stabilisation exercises exhibited reduced pain, reduced disability, improved endurance of back muscles and range of motion at the time follow-up.

Key words: Facet syndrome, Sustained Natural Apophyseal Glides

INTRODUCTION

The lumbosacral Facet joint is reported to be the source of pain in 15-40% of patients with chronic Low Back Pain (LBP). The first discussion of the facet joint as a source of LBP was by Goldwaith in 1911.[1] In 1927, Putti illustrated osteoarthritic changes of Facet joints in 75 cadavers of persons older than 40 years.[2] In 1933, Ghormley coined the term "facet syndrome" suggesting that hypertrophic changes secondary to osteoarthritis of the zygapophyseal processes led to lumbar nerve root entrapment, which caused LBP.[3]

In addition to causing localized spinal pain, facet joints may refer pain to adjacent structures. Pain referral patterns of facet joints have been well described[4-7]. Cervical facet joint pain may radiate to the neck, head and shoulders and lumbar facet joint

pain may refer to the back, buttocks and proximal lower extremities.

Physiotherapy treatments including land-based lower back mobility exercise and soft tissue massage may be of benefit during this time to improve the longer term outcomes of patients with chronic low back pain and facet joint pain.[8]

Mulligan's mobilization-with movement (MWM) treatment techniques are gaining increasing popularity for use in musculoskeletal conditions, such as low back pain (LBP) and other disorders[9]. One of the most important MWM techniques is described as the SNAG, pioneered by Brian Mulligan[10]. SNAG is an acronym for "sustained natural apophyseal glide" with the technique described as involving the application of an accessory passive glide to the lumbar vertebrae while the patient simultaneously performs an active movement[11].

The direction of the glide is argued to be along the plane of the facet joints and the technique is performed in a weight-bearing position (i.e.sitting, standing). Among the SNAG's basic principles of clinical management is an immediate reduction or cessation of pain and an increase in range of motion (ROM).[10-11]

A number of investigators have cited evidence that supports the use of stabilization exercises for enhancing spinal stability.[12] The local muscles are said to be crucial in this mechanism. This may be because of their contribution to maintaining the position of the spine and their ability to improve trunk endurance. Core stability training is frequently used to improve spinal stability. It has been used for many years in physical therapy and has become popular in fitness settings[13].It has been speculated that this method of training improves spinal stability and may assist in decreasing the risk of back pain.

Till date, no studies in physiotherapy have assessed efficacy of Sustained natural apophyseal glides treatment of lumbar facet joint syndrome. The aim of the case series, therefore, to describe the management and outcomes of 4 patients with lumbar facet joint syndrome treated with Sustained Natural apophyseal glides (SNAGs), Ultrasound and lumbar stabilization exercises.

CASE SERIES

Four consecutive patients, referred to physiotherapy outpatient department of with a diagnosis of lumbar facet joint syndrome were screened for the eligibility criteria in this case series. All participants satisfied the inclusion criteria i.e Participants diagnosed with facetal arthropathy on MRI, localised unilateral lumbar pain, replication or aggravation of pain by unilateral pressure over the facet joint, Pain eased in flexion, Pain in extension, lateral flexion or rotation to the ipsilateral side. Exclusion criteria for the study was history of Spinal Surgery, trauma to the spine, and manipulation under anaesthesia, Metabolic Disorders – Osteoporosis and Spinal Tumours. This study was approved by the Institutional Ethical Committee of PIMS, Loni. Each subject signed written informed consent before intervention.

Outcome Measures:

Modified Oswestry Low Back Disability Questionnaire: The questionnaire consists of 10 items addressing different aspects of function. Each item is scored from 0 to 5. Total Score was converted in percentage, scores range from 0-100% with lower scores meaning less disability.[14]

Pain : The pain VAS consisted of a 10 cm horizontal line anchored at one end by the words ‘no pain’ and at the other end by the words 'worst pain'. [15]

Back Endurance Testing: Sorensen Test: Biering-Sorensen described this method of testing isometric back endurance; it measures how long (to a maximum of 240 seconds) the subject can keep the unsupported trunk (from the upper border of the iliac crest) horizontal while prone on an examination table. Published studies demonstrate that the test assesses the endurance of all the Muscles involved in extension of the trunk, which include not only the paraspinal muscles, but notably the multifidus muscle. [16]

Spinal Range of Motion: Modified Schobers Test : Macrae and Wright[17] modified the original Schober method by marking a point 5 cm below and 10 cm superior to the lumbosacral junction. When the patient moves into full lumbar flexion, the increase in distance between the marks gives an estimate of spinal flexion ROM.

Intervention: All patients in this case series attended physiotherapy 5 times weekly for a period of 2 weeks. Each treatment session lasted for a total of 30

minutes. During the sessions, patients received Therapeutic ultrasound around affected area, Mulligans Sustained Natural Apophyseal glides and spinal stabilization exercises. After 2 weeks of active intervention subjects were allowed to continue stabilization exercises at home for 1 week until the follow up visit.

SNAG's Technique: The Mulligan's "SNAG" was applied on affected lumbar motion segment by therapist. SNAGs were performed from a comfortable sitting position in a plinth, while participants performed an active flexion 6 times. A belt was used, as advised by Mulligan (1999). Following palpation of the spinous process (to be mobilised), the force was applied in a parallel direction to the lumbar facet joints, via the ulnar styloid process of the therapist to the skin over the relevant spinal level. A total of 3 sets of mobilisation, in accordance with Mulligan's rule of three were administered with a one min break between sets. (Fig 1)

Follow-up Measurements: All patients completed the MODQ, VAS, Sorens test Score and Flexion – Extension range of motion at 3rd weeks (Follow up visit) after the initial examination.

Fig 1: Patient Receiving SNAGs Technique

Analysis: Pre-and post treatment scores were converted to a change score by formula: Change score= Pretreatment score-Post treatment score × 100 / Pre treatment score

Table 1: Pre & Post comparsion of VAS, MODQ, Soresens Test score

Case	VAS		% change	MODQ		% change	Sorensens Test Score		% change
	Pre	Post		Pre	Post		Pre	Post	
1	8	3.4	57.5	36	14	61.11	75	90	20
2	7	4.5	35.71	34	12	64.70	77	89	15.58
3	8	4	50	32	12	62.5	75	91	21.33
4	8	3.5	56.25	32	14	56.25	74	90	21.62

Outcome: All four patients showed the mean percentage change in score of VAS 49.87%, MODQ 61.14%, Sorensen test score 19.63% , Flexion range 9.21 % and extension range 17.07 % at the end of follow up. (Table 1)

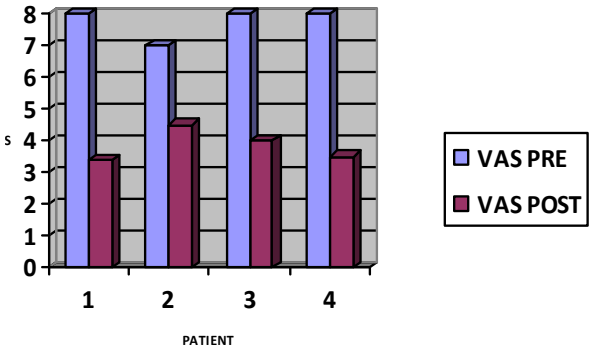

Fig 2: Visual analogue scale

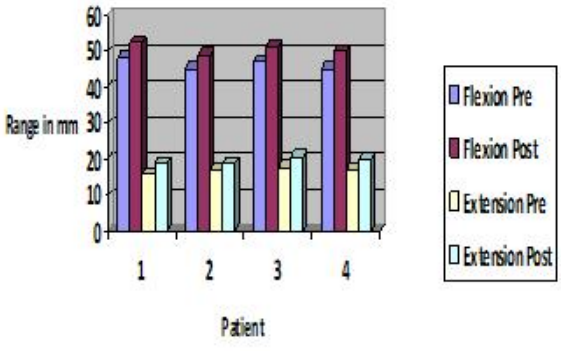

Fig 3: Spinal range of motion

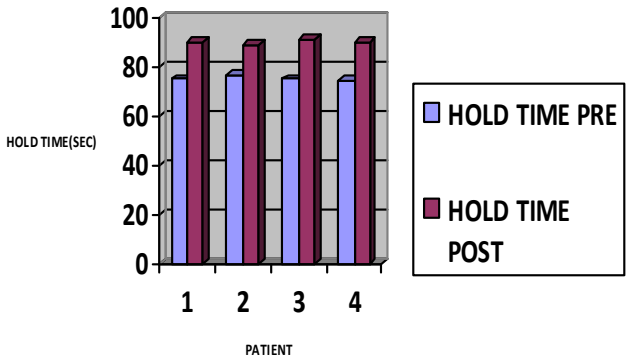

Fig 4: Sorensen's test holds time

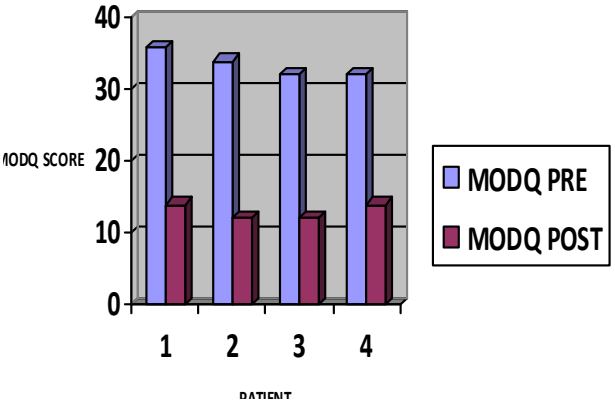

Fig 5: MODQ Score

DISCUSSION

The purpose of this case series was to describe the outcomes in four patients with Lumbar facet joint syndrome using SNAGs, Therapeutic Ultrasound and spinal Stabilisation exercises. Although a cause-and-effect relationship cannot be inferred from a case series, our results suggest that this particular treatment approach may be beneficial in improving the outcomes in patients with lumbar facet syndrome.

All four patients showed improvement in pain (49.87%) at the end of follow-up (Fig 2). The mechanism by which this MWM exerts its ameliorative effects in clinical practice remains somewhat of an enigma; however biomechanical and neurophysiological mechanisms may be involved[18-19]. Biomechanically it was proposed that MWM may address joint partner bone alignment[18] and positional faults[25].Potential neurophysiological mechanisms include changes in descending pain inhibitory systems and, and changes in central pain-processing mechanisms[20].

Our case series results showed improvement in flexion and extension range of motion (Fig 3) which in accordance with study by Kostantinou et al[27] investigated the immediate effects of MWM's in ROM and pain levels in 26 LBP patients with pain and flexion ROM limitations. Results of their study indicated that 73% of the intervention condition and 35% of the placebo condition had improvements in flexion-extension ROM (as measured with an inclinometer) and/or pain scores. According to Mulligan (1999) applying a SNAG may reposition the superior vertebra. Mulligans original theory for the effectiveness of a technique is based on concepts related to ' Positional Faults' that occur secondary to injury and lead to malt racking of the joint resulting in symptoms such as pain, stiffness and weakness. The cause of positional faults has been suggested to be due to changes in shape of articular surfaces, thickness of cartilage, orientation of fibers of ligaments and capsule, or the direction and pull of muscles and tendons. Mulligans technique correct this by repositioning the joint causing it to track normally.[21-22]

The MWM was largely conducted in a weight-bearing position and patients received simultaneous feedback of painless joint movements. This feedback might modulate psychological features such as fear of movements, resulting in an increased activity level. [23]

In present case series improvement (Mean 19.63%) was seen at hold time in Sorensens test (fig 4) at the end of follow up. Decreased trunk strength and endurance associated with a cyclical pattern of deconditioning through pain, avoidance and inactivity have been noted as defining characteristics in LBP (Biering-Sørensen, 1984; Mayer and Gatchel, 1988). In addition to improvement in Range of motion and reduction in pain, MWM in a weight-bearing position requires muscle activity, which might have resulted in improved motor performance and increase in strength of core muscles when applied along with core stabilisation exercises. Lumbopelvic stabilization approach seems to be useful for the management of low back pain. Based on a solid biomechanical model (Panjabi's hypotheses), it has demonstrated positive effects over pain and return to activity, but it is not clear the optimal type of exercise, duration or number of repetitions, among other variables. Exercises designed to improve spinal stabilization have gained popularity in the conservative treatment of patients with LBP; however, the evidence for the effectiveness of this approach is sparse and equivocal.[24] Improvements in pain intensity and

functional disability were also demonstrated in from results of our study (Fig 5) which are in according to previous studies including groups of patients with low back pain suffering from a spondylolisis or a spondylolisthesis[25]and a significant decrease of symptoms in people with hypermobility.[26]

CONCLUSION

In this case series, all four patients with Lumbar facet joint syndrome treated with sustained natural apophyseal glides (SNAGS), Therapeutic Ultrasound and lumbar stabilisation exercises exhibited reduced pain, reduced disability, improved endurance of back muscles and range of motion at the time follow-up. This report allows for initial hypothesis development that this approach may have clinical merit.

Limitations of the study: Limitations of this report are inherent to its case series design. Without a comparison group, we cannot determine if similar improvements would have occurred had these patients received a different treatment approach or no treatment at all. Future research in the form of randomized clinical trials should be conducted to investigate the effectiveness of this treatment approach in lumbar facet syndrome patients.

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Conflict of Interest: The author's report no conflict of interest

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