Using Qualitative Movement Analysis to Direct Rehabilitation of a Patient With Lumbo-Pelvic Pain and Generalised- Hypermobility Spectrum Disorder: A Case Study

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Introduction:

This case study describes an approach used in clinical practice to rehabilitate those with Generalised- Hypermobility Spectrum Disorder (G-HSD). The case is a 22-year-old female Exercise Physiology student and Pilates instructor (who will be referred to as AW) presented to clinic reporting multiple areas of pain around the back, hip and pelvis.

History:

AW's pain had gradually worsened over previous five months after starting her first sexual relationship. Prior to this injury, she was lifting heavy weights at gym and cross-trainer/bike sessions and attended Pilates sessions. She reported always being hypermobile and had chronic back pain following a motor vehicle accident when she was 13 years old.

AW reported left-sided upper lumbar pain, diffuse abdominal pain, left sided groin pain and right sided upper buttock pain radiating into her right lateral thigh to the knee. The pain frequency was 50% of the time, with her worst pain 5/10 and her usual pain 4/10. Pain self-efficacy questions *(Nicholas 2005)* collected on a numeral scale from 0-6 (*see Figure 4)* indicated a very poor confidence in her ability to perform her normal daily and sporting pursuits. Aggravating factors are summarised in *Table 3 (see initial column).*

Investigation Findings:

AW scored 3/5 on the 5-point Hypermobility Questionnaire and had a Beighton Score of 5/9.

Videoed movement analysis (*See Figure 2*) was collected with the app Hudl (by Agile Sport Technologies Inc). When standing AW had an increased lumbar lordosis with anterior pelvic tilt and moderate translation of her pelvis anteriorly with respect to her shoulder and lateral ankle. With one leg stance, AW had a very poor ability to maintain her balance and altered her trunk and pelvic alignment to compensate. This became more obvious during single leg squat with Trendelenburg's sign (contralateral hip drop) bilaterally, poor knee tracking with respect to foot position, and poor balance, with moderately increased postural sway.

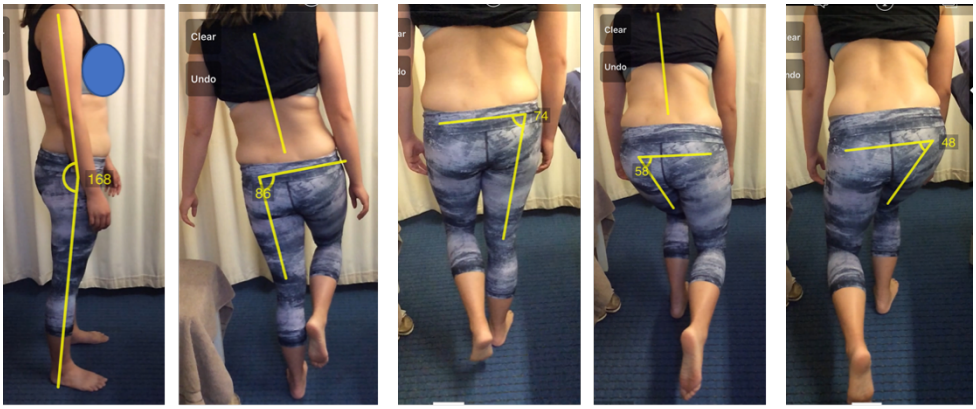


Figure 1: Analysis of Postural patterns – Initial assessment

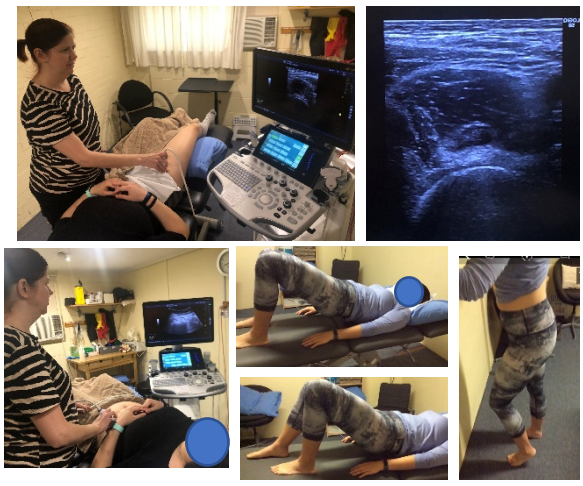
Other findings included a high degree of palpable resting muscle stiffness in her obliques upper gluteals, lateral thigh, and lumbar erector spinae muscles, especially on the right side. Hip flexion was only painful on the left at end of range flexion and isometric hip flexion at 90 degrees was painful on the left side. AW also had an unusual effort tremor in legs and trunk when asked to perform slow movement of the legs

Clinical Diagnosis:

- Generalised-Hypermobility Spectrum Disorder (G-HSD)
- Inefficient postural control mechanisms and poor load transfer across the lumbar spine and pelvis associated with pain in left groin, right upper buttock referring to lateral thigh and lumbar spine.

Intervention Summary:

1. Initial focus (*see Figure 2*) was on timing of relative recruitment of muscle synergists around the hip and pelvis, aiming to improve early recruitment of deeper musculature with a joint protection/stability role.



Real time ultrasound biofeedback also allowed training of more efficient patterns that avoid excessive and unnecessary early activation of superficial synergists.

Low load active range of motion concentric/eccentric with focus on recruitment and motor patterning was also introduced (Retchford et al, 2013).

Figure 2: Examples of isometric and low load exercises

2. Focus gradually shifted on subsequent sessions, with progressions into higher load, increased speed or combined movements added (*see Figure 3)*. These were to be

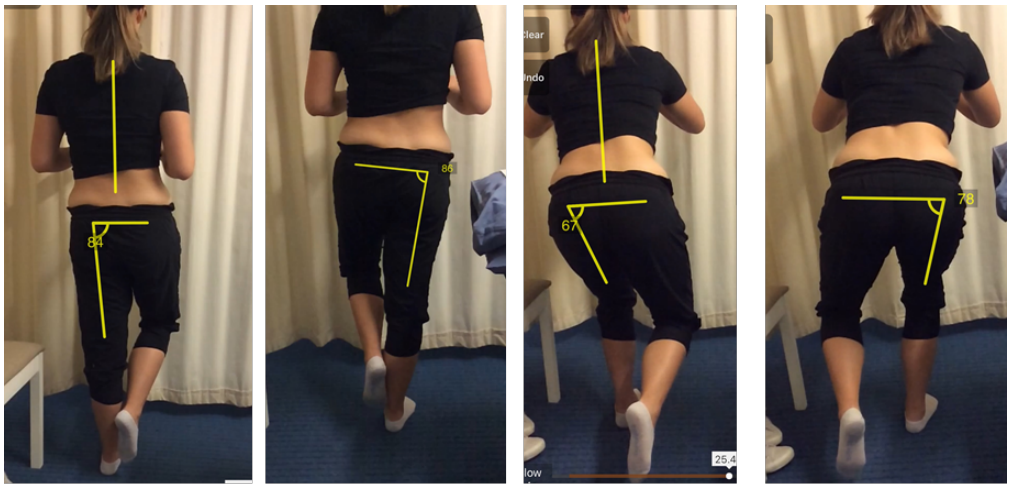
performed three times/week – AW integrated these into her gym program, which she was able to reintroduce due to decreasing pain.

Figure 3: Higher Load Exercise Examples

3. Multi-disciplinary care included consultation with an experienced pelvic floor physiotherapist and management of pelvic floor muscle overactivity was implemented. Superficial muscle massage was provided by an independent myotherapist.

Outcome:

At 4-month follow-up, qualitative movement analysis (*see Figure 5)* showed a visible improvement in AW's ability to maintain her pelvic alignment during single leg stance and single leg squat (*see Figure* 4). Her single leg stance was now good, and one leg squat on the right good, and the left fair. Balance was also more controlled (less postural sway) in all of these positions. The effort tremor with leg movement noted on initial assessment was no longer visible.



Single leg stance - left | Single leg stance - right | Single leg squat - left | Single leg squat - right

Figure 4: Analysis of Postural patterns – 4-month follow up

Discussion:

AW reported improvement in her symptoms on the global rating of change scale (GROC) from three months of the exercise program and this GROC continued to improve with continued monthly reviews and progressions.

GROC	
Initial	Baseline/ No change
3 months	Slightly to moderately better
4 months	Moderately to very much better
9 months	Very much better

Table 1: Global Rating of Change (GROC) (Kamper et al, 2009)

On the pain reporting scale (*see Table 2*), AW reported a 20% decrease in the overall frequency of her pain and reported a numerical reduction in intensity of her worst pain and her usual pain at follow up nine months later.

Pain Reporting	**Initial**	**9-month Follow up**
Pain frequency	50%	30%
Worst pain (0-10 scale)	5	4
Usual pain (0-10 scale)	4	2

Table 2: Patient pain reporting scale

Initial	**9-month follow up**
Sitting - especially driving	Prolonged periods of sitting
Lying on my side	Deadlifting barbell from floor
Urination	Loaded Hip flexion past ~80 °
Intimate Relations	Bike riding more than ~25-30km

Table 3: Patient Listed Problematic Activities

But perhaps more importantly, when we compare the issues AW lists as her significant functional problems (*see Table 3*), it can be seen that the activities that are problematic at 9-month follow-up, are more related to her high-level sporting pursuits rather than more basic activities of daily living that were problematic prior to the rehab program.
This is a common clinical observation with hypermobile patients – pain levels often decrease somewhat but it is the increases in functional ability that often indicate a successful rehabilitation program.
As a final point, the improvement in AW's confidence with her everyday tasks (despite her pain) has had a powerful improvement. This can be seen in *Figure 5* which compares the pain self-efficacy questions at initial and 9 months follow up.

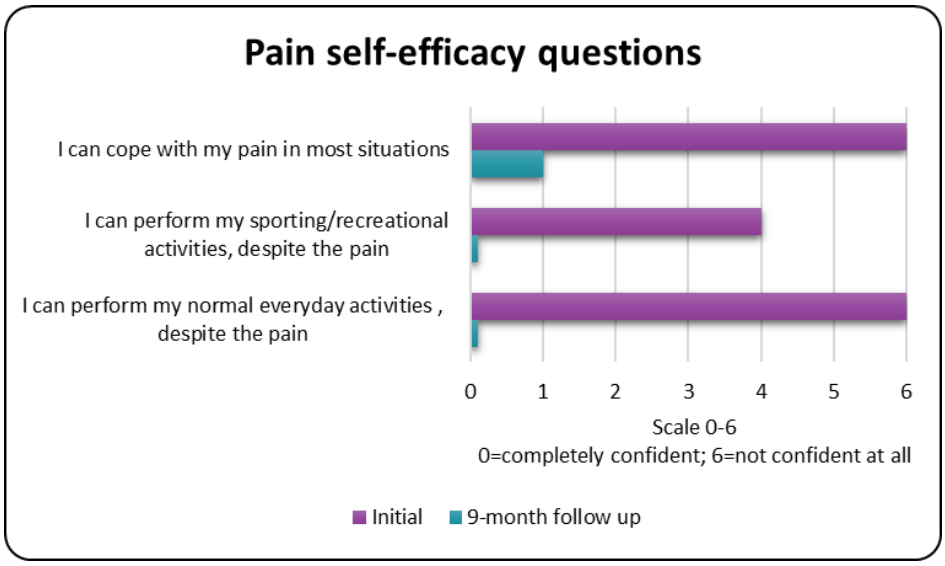


Figure 5: Pain self-efficacy

Conclusion:

Analysis and directed rehabilitation of common postural patterns has had positive improvement in this client with G-HSD. Qualitative improvement in the one leg stance and one leg squat appears to also correspond to an improvement in the GROC, pain scales and pain self-efficacy questions.

The use of qualitative analysis of functional movement patterns and targeted rehabilitation to address these patterns, can improve function and decrease pain.

Moving forward, further analysis through a clinical case series may be able to show further evidence for refining and reporting of qualitative movement patterns. Further focus on showing improvement in objective measurements would be needed to add validity to the results.

References:

Kamper SJ, Maher CG, Mackay G. Global rating of change scales: a review of strengths and weaknesses and considerations for design. *J Man Manip Ther*. 2009;17(3):163-170. doi:10.1179/jmt.2009.17.3.163

Nicholas MK. The pain self-efficacy questionnaire: Taking pain into account. *Eur J Pain*. 2007;11(2):153-163. doi:10.1016/j.ejpain.2005.12.008

Retchford TH, Crossley KM, Grimaldi A, Kemp JL, Cowan SM. Can local muscles augment stability in the hip? A narrative literature review. J Musculoskelet Neuronal Interact. 2013;13(1):1-12.

DECLARATIONS OF INTEREST:

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