

Restored heart function and reduced recovery time in a 36-year-old female patient following a Pulmonary Embolism and induced coma: A case report

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Background: A fit, healthy, regularly adjusted 36-year-old female suffered a pulmonary embolism following a long haul flight from the USA to Australia. Emergency Medical care included intubation and an induced coma before discharge at which point she commenced an intensive regime of Chiropractic care.

Intervention: Chiropractic care was provided using diversified technique, Thompson and drop piece adjusting techniques following discharge from hospital. This regime of care aligned with the patient's Chiropractic philosophy.

Outcome: The patient was fully recovered within three weeks of discharge from hospital, with heart function within normal limits. Given the life-threatening nature of the incident, and the normal recovery time for such patients, we feel this is significant and may provide rationale for further study into Chiropractic care and improved recovery times.

Indexing Terms: Chiropractic; subluxation; pulmonary embolism; salutogenesis; philosophy.

Introduction

While research into chiropractic is eliciting promising results in the fields of human performance, with discoveries into pelvic floor function, bite force, strength, and a shortened cortical silent period all emerging in recent years, we have yet to examine the impact of chiropractic on recovery time after significant injury or health emergency. (1 - 6)

Recovery following an injury can be difficult to articulate and compare between individuals. Pain is the most popular metric to highlight in cases of injury recovery, as it can be quantifiably measured and is most often at the forefront of reports as it is a primary concern of patients. It should be noted that although pain can be debilitating, there is more to recovery than pain reduction.

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In line with the Chiropractic paradigm, viewing the recovery time through a lens of optimal nervous system function leading to increased adaptability and decreased recovery time becomes an opportunity to explore.

This case report details the Chiropractic management of an individual recovering from biventricular failure and a potentially fatal pulmonary embolism.

Case details

A 36-year-old female who was under regular Chiropractic care had just completed a long-haul flight from the USA to Australia when, upon landing in Brisbane, she fainted and experienced three seizures. Upon transportation to a hospital the patient was diagnosed with a pulmonary embolism (PE) with biventricular failure. This was deemed to be due to the long-haul flight combined with the patient being on the combined oral contraceptive pill (COCP). The patient underwent ECMO, intubation and was admitted to the Intensive Care Unit for four days. During this time, the patient also received blood transfusions and heparin infusions. The patient was transferred to General Ward and placed under observation for another three days, then discharged.

Medical history and clinical findings

Prior to this incident the patient was asymptomatic and under regular Chiropractic care. Upon presentation to the hospital, CT results revealed an extensive bilateral pulmonary emboli, extending within bilateral pulmonary trunks, throughout the pulmonary arterial tree into innumerable segmental and sub-segmental pulmonary arteries. There was also evidence of associated right ventricular strain.

The CT Head was unremarkable. However, biventricular dysfunction was severe, with 15% function at the time of the PE. The patient's oxygen levels were recorded at 50% at the time of the PE.

She then had routine vitals recorded every four hours during her hospitalisation. During this time, blood pressure was recorded within normal limits, and oxygen levels were recorded regularly at 97-99%. Temperature held within normal limits also.

However, the patient's resting heart rate was regularly recording between 112-125 beats per minute. Upon discharge, the patient was still recording elevated resting heart rates between 110-119 and the patient was experiencing what was for her, significant fatigue. The patient is normally fit, healthy, energetic and active.

Following her release from hospital, the patient immediately sought Chiropractic care. She was examined and accepted a moderate course of care spanning six visits in three weeks.

The subluxations findings per visit were as follows:

- ▶ Visit 1: RPIN, L4LP, T6RP, C1LP, C4RP
- ▶ Visit 2 (2 days later): RPIN, L4LP, T6RP, C1LP, C4RP
- ▶ Visit 3: RAIS, L5RP, T5LP, C2RP
- ▶ Visit 4 (7 days after Visit 1): RAIS, L5RP, T5LP, C2RP, C5LP
- ▶ Visit 5 (14 days after Visit 1): RPIN, L5LP, T6RP, C1LP
- ▶ Visit 6 (21 days after Visit 1): RPIN, L5LP, T8RP, T4LP, C1LP

During this time the patient's autonomic function was monitored using resting heart rate and oxygen levels, range of motion measures and pulse oximetry. She was adjusted using diversified technique, SOT Blocks and Thompson Drop Piece.

The aims of care were to improve resting heart rate and lumbopelvic function of the patient to the ECMO performed on her right femoral artery in the upper thigh. Due to the severity of the incident, reviews were conducted at every visit with a full evaluation every week. Given the severity of the PE and biventricular failure, specific areas of focus included improving the patients polyvagal and autonomic nervous system response.

Outcomes

We are unable to speculate as to whether ongoing Chiropractic care was a protective factor in surviving the original incident, only that the original presentation at emergency was considered as medically severe.

The major positive outcome of this case is that the patient had a repeat ECG and heart ultrasound three weeks after discharge and was deemed to have heart function returned to within normal limits. This was stated as being shorter than the expected recovery time, and allowed the patient to return to work and activities of daily living.

At the beginning of her post-hospitalisation chiropractic care plan, the patient had significant lumbopelvic dysfunction due to the ECMO procedure and sutures over the right femoral artery. The patient also had significantly decreased ROM of cervical and lumbar regions. Vitals taken over the course of the six visits showed normalising heart rate overall, as well as significant pre and post adjustment differences. They are as follows:

Visit 1:

- ▶ Pre-adjustment Resting HR: 112
- ▶ Post-adjustment Resting HR: 87
- ▶ Pre-adjustment oxygen levels: 97%
- ▶ Post-adjustment oxygen levels: 99%

Visit 2 (2 days later):

- ▶ Pre-adjustment Resting HR: 99
- ▶ Post-adjustment Resting HR: 89
- ▶ Pre-adjustment oxygen levels: 97%
- ▶ Post-adjustment oxygen levels: 99%

Visit 3:

- ▶ Pre-adjustment Resting HR: 84
- ▶ Post-adjustment Resting HR: 62
- ▶ Pre-adjustment oxygen levels: 98%
- ▶ Post-adjustment oxygen levels: 99%

Visit 4 (7 days later from Visit 1):

- ▶ Pre-adjustment Resting HR: 80
- ▶ Post-adjustment Resting HR: 72
- ▶ Pre-adjustment oxygen levels: 98%
- ▶ Post-adjustment oxygen levels: 99%

Visit 5 (14 days later from Visit 1):

- ▶ Pre-adjustment Resting HR: 87
- ▶ Post-adjustment Resting HR: 77

- ▶ Pre-adjustment oxygen levels: 99%
- ▶ Post-adjustment oxygen levels: 99%

Visit 6 (21 days later from Visit 1):

- ▶ Pre-adjustment Resting HR: 78
- ▶ Post-adjustment Resting HR: 65
- ▶ Pre-adjustment oxygen levels: 99%
- ▶ Post-adjustment oxygen levels: 99%

The patient reported reducing fatigue periods as the care plan progressed and was able to return to work at full capacity by Visit 5, whereby she was also able to complete all activities of daily life effectively. The patient also reported improved concentration levels concomitant with the advancement of the care plan. Objective findings confirmed that her range of motion improved significantly, most noticeably the right lower extremity and lumbopelvic region. This was particularly notable due to the ECMO procedure on the right side.

From a clinical point of view, the cardiologist then deemed it not necessary for this patient to be placed on heart medication due to the normal function of the heart and the decreasing nature of the resting HR. This was a departure from the traditional trajectory expected following such an injury.

At the conclusion of the six visits, the patient reported that she was feeling almost her normal self prior to the incident, with only the healing nature of the suture wound causing some tightness and restriction. She attributes her quick recovery to previous regular Chiropractic care and targeted Chiropractic care after the incident assisting with recovery and getting her back to normal ADLs relatively quickly.

Discussion

By all reports from treating practitioners, the patient was considered fortunate to have survived the incident. This makes the patient's return to normal activities of note. Chiropractic care was thought to contribute to the improvements observed and noted over the course of the six sessions, and may indicate that the patient's nervous system, particularly her autonomic nervous system, was quickly able to self-regulate, self-heal, and self-adapt.

These changes reinforce the philosophical concept of having regular Chiropractic care to support fast recovery when crises do happen to the body.

Although the measure of heart rate variability (HRV) was not used in this case, resting heart rate was recorded throughout and showed marked pre and post adjustment changes, as well as an arc of significant improvement in a short timespan (especially given the severity of the injury). Average heart rate and resting heart rates can be indicative of the variability a heart is capable of, the decreasing trend in resting heart rate suggesting an increasing capacity for variation. (7)

All the specialists and consultants looking after this patient expressed that in '*normal circumstances*' this patient should have passed away or have cognitive damage. Therefore the finding that the patient has made a full and swift recovery is significant. While we are limited in what we can claim, this case report provides a remarkable comparison to the expected outcome of the health crisis, and may provide comparison when it comes to the recovery of those not under regular chiropractic care.

Further research examining recovery rates and comparing them with those under regular Chiropractic care would be beneficial in order to bridge the research and lived experience of the Chiropractic cohort with the data on non-recipient of Chiropractic care. This would allow us to

better understand the role of Chiropractic in rehabilitation, recovery and reducing the burden of disease and hospital care.

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About the authors

Dr Jennifer Luu graduated from the Royal Melbourne Institute of Technology (RMIT) in 2012. Dr Luu is passionate about being a servant to service, and as such, aims to be a positive influence on as many lives possible, so they, too, can be a positive influence on as many lives as possible.

She is involved with *To Love & Serve*, where she coordinates teams of chiropractic volunteers in Cambodia and creates products for the chiropractic profession.

Dr Luu is the current Vice-President of the *Australian Spinal Research Foundation* and Board Director of the *International Federation of Chiropractors & Organizations*

Dr. Brad graduated from RMIT in 2002. He has a strong philosophy in wellness chiropractic and focuses on improving the health of the community through enhancing spinal health and wellbeing. Dr Brad enjoys working with elite athletes he holds an International Chiropractic Sports Science Diploma (ICSSD).

He loves working with kids and offers care from to all members of the community from newborns to the elderly. Dr. Brad has served as an executive board member of the *Chiropractors' Association of Australia Victorian branch*.

Dr Brad is also heavily involved in furthering the education of chiropractors and organising seminars throughout Australia. In 2016, Dr. Brad was awarded for his outstanding service to the chiropractic profession.

About the Case Report project

This Case Report is a part of the [ASRF Case Report Project](#), a project designed to gather client studies from chiropractors and transform them into much-needed case reports, focused on the effects of chiropractic care on clinical presentations highly relevant to chiropractic, such as stress, immunity and adaptability.

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