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Collaborative care for a patient with complex low back pain and long-term tobacco use: a case report

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Few examples of interprofessional collaboration by chiropractors and other healthcare professionals are available. This case report describes an older adult with complex low back pain and longstanding tobacco use who received collaborative healthcare while enrolled in a clinical trial. This 65 year-old female retired office worker presented with chronic back pain. Imaging findings included disc extrusion and spinal stenosis. Multiple co-morbidities and the complex nature of this case substantiated the need for multidisciplinary collaboration. A doctor of chiropractic and a doctor

Il y a peu d'exemples de collaboration interprofessionnelle entre les chiropraticiens et d'autres professionnels de la santé. Cette étude de cas décrit une personne âgée souffrant d'une lombalgie complexe et de tabagisme de longue date qui a reçu des soins de santé en collaboration pendant qu'elle participait à un essai clinique. Cette employée de bureau à la retraite âgée de 65 ans souffrait d'une lombalgie chronique. Les examens d'imagerie ont révélé des extrusions discales et une sténose rachidienne. Des comorbidités multiples et la nature complexe de ce cas ont justifié la nécessité d'une collaboration multidisciplinaire. Un chiropraticien et un ostéopathe ont fourni des soins en collaboration selon

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of osteopathy provided collaborative care based on patient goal setting and supported by structured interdisciplinary communication, including record sharing and telephone consultations. Chiropractic and medical interventions included spinal manipulation, exercise, tobacco reduction counseling, analgesic use, nicotine replacement, dietary and ergonomic recommendations, and stress reduction strategies. Collaborative care facilitated active involvement of the patient and resulted in decreased radicular symptoms, improvements in activities of daily living, and tobacco use reduction.

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KEY WORDS: chiropractic, integrative medicine, interdisciplinary communication, low back pain, patient-centered care, radiculopathy, spinal manipulation, tobacco use cessation

les objectifs établis pour la patiente et soutenus par une communication interdisciplinaire structurée, y compris le partage du dossier et des consultations téléphoniques. Les interventions chiropratiques et médicales étaient notamment axées sur la manipulation vertébrale, l'exercice, des conseils sur la réduction de l'usage du tabac, l'utilisation d'analgésiques, le remplacement de la nicotine, des recommandations diététiques et ergonomiques, et des stratégies de réduction du stress. Les soins en collaboration ont facilité la participation active de la patiente et ont entraîné une diminution des symptômes radiculaires, des améliorations dans les activités de la vie quotidienne, et la réduction de l'usage du tabac.

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MOTS CLÉS : chiropratique, médecine intégrative, communication interdisciplinaire, lombalgie, soins centrés sur le patient, radiculopathie, manipulation vertébrale, cessation du tabagisme

Introduction

Older adults with low back pain (LBP) often represent a complex clinical picture due to the inherent challenges of treating LBP especially when combined with multiple co-morbidities.[1-4] Given the potential for such complexity, it is important for clinicians and patients to consider these elements as management plans are designed and implemented.[2,5] Multidisciplinary collaborative care including care coordination among providers is one possible approach to the management of complex LBP.[1,2,6,7]

Boon and colleagues defined collaborative care as "an interprofessional process for communication and decision making that enables the separate and shared knowledge and skills of health providers to synergistically influence patient care."[8,9] Successful collaboration requires patient interest and involvement[10-12], mutual respect[9,10,12], maintenance of professional autonomy[8,13,14], understanding each team members' practice scope[9,13,15-17], goal setting[9,10,13], and an openness to discussion and consensus building processes[13]. Communication models that may support interprofessional collaboration include telephone consultations[10,18-20] or face-to-face meetings[10,16,18,21], job shadowing experiences[9,16,20], use of electronic medical records[9,14,18], and confirming understanding among team members[12,19,21].

This case presentation describes a collaborative effort between healthcare providers and a patient enrolled in a clinical trial on interdisciplinary co-management of older adults with LBP.[20,22] The trial randomly allocated eligible participants to receive 12-weeks of LBP care under 1 of 3 professional practice models: medical care; concurrent medical and chiropractic care; or collaborative care involving the patient and a medical and chiropractic co-management team. The co-management team collaborated through scheduled phone consultations and a secure, web-based, electronic communication system to share health records between the different health systems involved.[20] The interprofessional practice model emphasized patient goal setting; provider discussions of diagnoses, complicating factors and challenges to treatment; a cooperative treatment approach; monitoring patient status and care challenges; and ongoing support of the patient's treatment goals.[20] The co-managing practitioners in this case were a doctor of chiropractic (DC) working at a

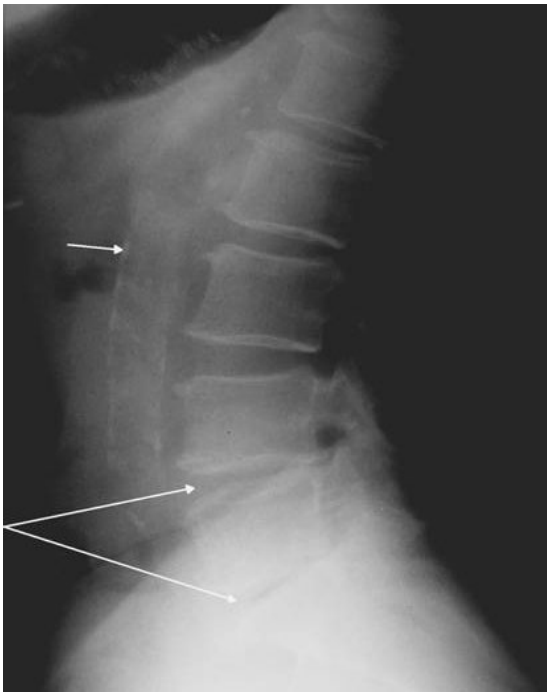

Figure 1.
Lateral lumbar spine x-ray: showing arteriosclerotic calcification of the abdominal aorta (short arrow), osteophytes throughout the lumbar spine, and advanced disc degeneration at L4-5, L5-S1 (long arrows).

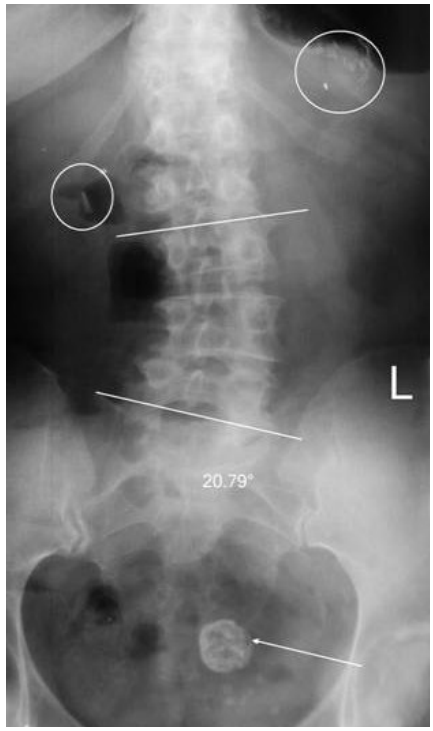

Figure 2.
A-P lumbar x-ray: showing a 21° lumbar curvature, surgical clips (circled) and a 2.6 cm diameter density consistent with uterine fibroid (arrow).

chiropractic research center and a doctor of osteopathy (DO) completing a residency in family medicine. This case report discusses the collaboration process of a DC, DO, and patient engaged in the management of complex LBP in an older adult.

Case presentation

Clinical history

A 65 year-old female retired office worker presented with LBP and constant radiation to the left gluteal and posterior thigh regions with occasional radiation to the great toe. The LBP first occurred 30 years prior when the patient acquired a flexed and twisted trunk position causing immediate and severe pain. Daily activities became progressively affected, albeit gradually over 30 years.

This patient's healthcare seeking for her LBP depicted a common fragmented patient care history of being 'in the system.'[23] This fragmented care included multiple primary care evaluations, specialist referrals, repeated imaging studies, minimal attention to co-morbid conditions potentially complicating her LBP, consultations with complementary and alternative providers, and an overall lack of care coordination.

Thirty-four months prior to examination in our clinic, the patient underwent a lumbar magnetic resonance imaging (MRI) scan and an orthopaedic evaluation, which included lumbar radiographs. She then received corticosteroid injections that relieved the pain extending below the knee. Subsequently, the patient received chiropractic care with another provider 6 months prior to our examination. Care from medical and chiropractic providers resulted in partial, temporary improvement. At our initial evaluation, symptoms were severe enough to cause sleep interruption and interfere substantially with activities of daily living (ADL).

Table 1.
Clinical history and concurrent conditions

Diagnosis	Health History and Current Status
Spinal conditions	• Lumbar disc degeneration (Figure 1) • Lumbar central canal stenosis • L4-S1 bilateral neural foraminal stenosis • 21^0 left lumbar curvature (Figure 2)
Activities of daily living impairments	• Reduced ability to stand and walk with limitations reported in ability to shop, cook, clean and garden • Timed get up go test averaged 11.63 seconds (independent mobility); patient had shooting pain into left thigh with test • Exercise avoidance due to pain reported with movement • Positional sleep interruption resulting in fatigue • Increased bed rest for pain relief
Tobacco dependence	• Current cigarette smoker reporting 1.5-2 packs/day • 60-90 pack-year history over 45 years • Self-reported use of tobacco as coping mechanism for back pain
Obesity	• History of bariatric surgery (Figure 2) • Body Mass index = 33.1 (Height 164.08 centimeters, Weight 88.90 kilograms)
Mental health conditions	• Self-reported history of anxiety, depression and post-traumatic stress disorder • Self-reported current life and family stressors • Previously treated with supportive therapy and medication • Currently not receiving any mental health care
Benign positional vertigo	• Self-reported fall 3 years ago due to vertigo symptoms • Symptoms recurrent but milder than at onset
Cardiovascular conditions	• Hypertension medically managed with angiotensin converting enzyme inhibitor/diuretic • Blood pressure 132/75 • Abdominal aortic calcification (Figure 1)

Examination

The patient reported her LBP at a level of 6 of 10 on the 0-10 numeric rating scale for pain. Examination findings included limited lumbar extension, radiating pain to the left posterior thigh with Valsalva's maneuver and during a brief walking test[24], and a positive straight leg raise test with radiation to the posterior thigh.

Imaging

Lumbar radiographs obtained from the prior orthopaedic evaluation demonstrated disc narrowing at L4-5 and L5-S1, endplate osteophytosis in the lower thoracic region and throughout the lumbar spine, a 21° left lumbar convexity, mild osteoporosis, arteriosclerotic calcification of the abdominal aorta, calcification within the pelvis consistent with a uterine fibroid, and evidence of abdominal surgery consistent with a history of bariatric surgery and cholecystectomy (Figures 1 and 2). Previous lumbar MRI demonstrated L5-S1 left para-central disc extrusion with slight displacement of the left S1 nerve root and severe bilateral neural foraminal stenosis. At L4-5 there was mild/moderate central canal stenosis, a small central disc protrusion and bilateral foraminal stenosis.

Diagnosis

DC evaluation revealed a diagnosis of non-compressive lumbar radiculopathy and neurogenic claudication.[25] The examining DO documented a diagnosis of chronic LBP due to a previous injury. Though a straight leg raise test produced symptoms in the posterior thigh, examination by both providers revealed no conclusive evidence for the clinical presentation of compressive radiculopathy despite MRI evidence of nerve root displacement and foraminal stenosis. Table 1 presents the patient's clinical history and concurrent conditions. Notably, there was a 45-year smoking history (1.5-2 packs of cigarettes/ day),

obesity, physical inactivity, and significant ADL impairment.

Case management

LBP management

Treatment goals were determined jointly at the first chiropractic visit by the DC and patient as: 1) reduction of LBP, 2) improved psychological management of chronic pain and 3) improved ability to perform ADLs. Specifically, the patient hoped to participate in gardening activities with less pain. Goal 1 was addressed by manual lumbar distraction, gentle high velocity manipulation at the left sacroiliac joint[26-29], and manual ischemic compression of associated hypertonic muscles[30,31]. Goal 2 was supported by the recommendation of a mindfulness meditation technique as a strategy to help manage stress and assist with pain reduction.[32] Goal 3 was supported by the in-office chiropractic treatments and home exercise recommendations consisting of gentle stretching exercises with trunk motions and brisk walking to tolerance.[33,34] The DC advised tobacco cessation, although this was not a high priority for the patient at first.

The DO initiated a similar goal-setting process, identifying short-term pain management as an objective. To achieve this goal, the DO recommended acetaminophen, emphasizing appropriate dosing and side effects. Weight reduction through physical activity was explored, but no acceptable options were identified as exercise increased the patient's LBP. The patient agreed to attempt weight reduction through diet modification. The DO also recommended continuation of chiropractic care.

Tobacco cessation

During the initial DO visit, the patient expressed that her addiction to tobacco was troubling because she was aware it worsened her LBP recovery prognosis. These concerns motivated her and the DO to initiate a trial of nicotine replacement therapy to facilitate smoking reduction. After a review of previous medication use for smoking cessation and prior side effects, a nicotine patch was prescribed.

During a subsequent visit, the DC recommended an additional supportive measure of a Personal Quit Plan (PQP), developed during a 30-minute consultation that included the association of smoking and chronic LBP.[35] The PQP was developed for use by DCs,[36] based on the American Cancer Society's *Guide to Quit Smoking*[37]. The written PQP included reasons for tobacco cessation, financial implications, a plan for support by family and friends, and a quit date. Additional suggestions included replacements for social cues of tobacco use, stress reduction through breathing and meditation techniques, and behavioral changes, such as removing cigarettes and ashtrays, increased engagement in enjoyable activities such as gardening and constructing puzzles, and drinking water. The patient's PQP was shared with the DO through the secure health record website. Collaborative communications between the patient and providers confirmed the smoking reduction goal and reinforced team member roles. A summary of interprofessional communications is provided in Table 2.

Outcomes

Figure 3 depicts the patient's LBP outcomes, smoking habits, and tobacco cessation efforts during the trial. The patient rated her LBP at 1-2 on the 0-10 numerical rating scale at the end of the 12-week intervention, down from 6/10 at baseline. She reported performing some gardening activity, yard-work, and housework with less pain and a reduced amount of pain medication. Both providers made final recommendations, which included continued walking and exercises to improve core stability, acetaminophen for pain relief, limited heavy lifting and twisting motions, and chiropractic and/or medical care as needed.

The patient ceased smoking for 6.5 consecutive days. She discontinued the nicotine patch and resumed tobacco use after experiencing increased psychological stress, LBP, and a side effect of skin irritation. At a subsequent visit to the DO, the patient expressed frustration that "her quitting efforts had been a failure." The DO congratulated the patient, stating "this was a victory and not a defeat." The patient considered further smoking cessation efforts, but expressed concern over dealing with life and family stressors without smoking as a coping mechanism. Both providers encouraged continued smoking cessation efforts following discharge.

Discussion

While best practices for chiropractic care recommend multidisciplinary management when appropriate[2], there are few examples available in the scientific literature of interprofessional collaboration that describe chiroprac-

Table 2.
Interprofessional communications during case co-management

Week	Communication Type	Patient Goals	Interprofessional Communication Summary
1	Treatment summary/DC	• Pain reduction for LBP • Improved psychological management of chronic pain • Improved ability to perform ADLs (gardening, walking)	• Low back pain diagnosis with description and rationale for recommended treatment • Lumbar distraction • Gentle high velocity manipulation at the left sacroiliac joint to improve joint function • Home exercise recommendations included trunk motions and brisk walking using a short stride with mild effort to tolerance • Tobacco cessation advised
3	Treatment summary/DO	• Short-term pain management • Tobacco use cessation due to the costs of smoking and expressed embarrassment from habit	• Low back pain and tobacco use diagnosis with treatment recommendations • Acetaminophen recommended for short term pain relief • Continue chiropractic care as scheduled • Weight reduction through diet (increased physical activity not recommended due to pain with movement) • Tobacco cessation with nicotine patch • Review of previous medications and side effects for smoking reduction
4	Phone call summary/DO Phone call summary/DC		• Tobacco use and excess weight as factors that worsen inflammation in patients with chronic low back pain • Pain reduction techniques, such as relaxation response
5	Health records/DC	• Tobacco use reduction or cessation	• Personal Quit Plan with behavioral measures along with nicotine patch to support tobacco reduction
6	Treatment summary/DC	• Tobacco use reduction or cessation	• Cessation length compared to previous history (current effort lasted 6.5 days; Previous cessation lasted 6 days during an inpatient hospitalization without access to cigarettes.) • Challenges related to life stresses (family stress, lack of sleep, and increased LBP combined to decrease ability to resist smoking) • Home exercise recommendations included thoracolumbar lateral flexion isometric exercises
12	Phone call summary/DO Phone call summary/DC		• Summary of gains with treatment • Decreased pain level • Improved ability to perform ADLs • Reduced pain medication Future recommendations • Acetaminophen as needed for pain • Walking regularly for exercise • Avoiding twisting and lifting while performing ADLs such as gardening • Continued smoking cessation efforts.
14	Treatment summary/DC	• Better understanding condition and self-management tools.	• Diagnosis • Summary of care • Treatment goals • Outcomes relating to decreased pain with ADLs • Result of tobacco cessation effort, and • Continued recommendations for tobacco reduction • Performing exercises more regularly • Chiropractic and/or medical care on an as needed basis

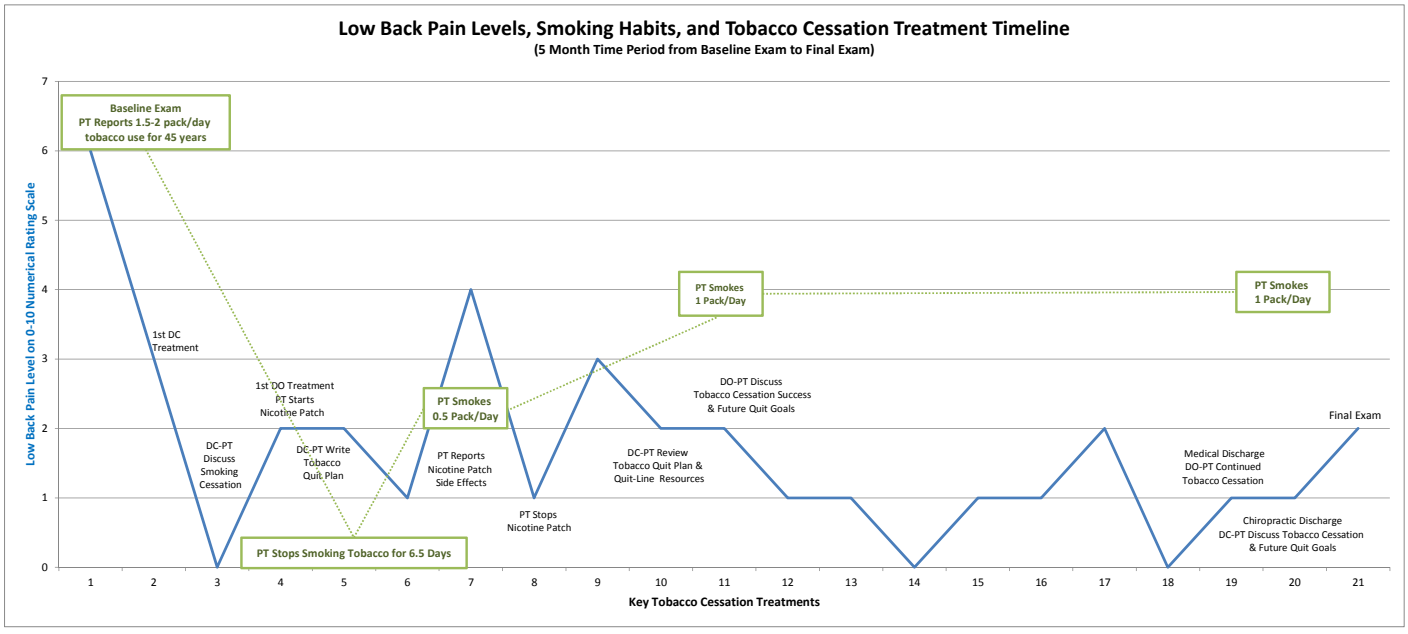

Figure 3.
Low Back Pain Levels, Smoking Habits, and Tobacco Cessation Treatment Timeline

tic patients of any age[7,9,17,38], much less for older adults with complex LBP[2,17,39]. This 65-year old female patient exhibited chronic LBP diagnosed as non-compressive lumbar radiculopathy and neurogenic claudication complicated by spinal curvature and degeneration, obesity, physical inactivity, impaired ADLs, life stresses, cardiovascular disease, and long standing tobacco use.

Some clinical guidelines support comprehensive multidisciplinary approaches for LBP management, with collaboration encouraged between practitioners[40], while others note the effectiveness of such treatments has not been compared to less intensive programs[41]. Although chiropractic may be delivered concurrently with medical services[42], care coordination or collaboration between patients and providers may not occur[13,19,43]. Co-management, referral, and health record sharing between medical doctors and DCs is often limited[7,42,44-48] and may result in care fragmentation[9]. Patients and providers may not discuss the concurrent use of conventional and complementary medicine[43], which precludes the opportunity for integrated care and may impact "efficiency, quality, and patient safety in health care delivery systems"[44]. Collaborative care can be essential in expediting timely referral for complicated geriatric conditions.[49,50]

In the case reported here, tobacco cessation was a main focus of care coordination. The Council on Chiropractic Education urges chiropractors to provide information and resources to every patient who smokes and indicates a willingness to attempt smoking cessation.[51] Both providers evaluated this patient's tobacco use history, reviewed the relationship between LBP and smoking, and encouraged tobacco cessation both as a pain management strategy and as beneficial for overall health.[35,37,52-55] The patient successfully refrained from cigarette smoking for 6.5 days, the longest reported cessation in her 45-year smoking history.

This case supports the concept of improving the effectiveness of health care for chronic LBP in older adults by information sharing and coordinated decision making between practitioners and by incorporating the patient as an active member of the treatment team.[10,11] A recent focus group study demonstrated older adults' interest in LBP co-management by chiropractors and medical physicians.[19] Indicators of successful co-management valued

by older adults in the study included "patient-centered communication, collegial interdisciplinary interactions between these providers, and health record sharing".[19] Another qualitative study on treatment coordination in primary care models reported that while continuity and information sharing is important, they are not adequate to provide care coordination for complex health conditions, and patient participation in decision-making must also be incorporated.[9-11,14]

Conclusion

This case report demonstrated interprofessional collaboration in the treatment of an older adult with complex low back pain and tobacco use by a DC and a DO. Collaboration may improve the treatment effectiveness of musculoskeletal disorders which are often multifactorial in causation. Effective collaboration encompassed interactions between diverse health practitioners and the patient's opinions and preferences. This healthcare team used a patient-centered approach that included the patient's participation in goal setting and attainment, health record sharing, structured interdisciplinary communications, and cooperative treatment plans. For successful implementation, a collaborative care model must be specifically selected and tailored for the practice settings involved.

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