Journal of Ayurveda and Integrative Medicine 15 (2024) 100964

Contents lists available at ScienceDirect

Journal of Ayurveda and Integrative Medicine

journal homepage: elsevier.com/locate/jaim

Management of congenitally fused cervical vertebrae with Ayurveda intervention - A case report

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ARTICLE INFO

Keywords:
Ayurveda treatment
C3–C4 vertebrae
Congenital anomaly
Fused cervical vertebrae
Neck disability index

ABSTRACT

A 42-year-old male patient presented with complaints of vertigo, neck pain, swallowing difficulties, and difficulty in maintaining an upright posture. The patient took allopathic consultation for the complaints and was advised to undergo MDCT scan of brain, hematological and audiological evaluations. No abnormalities were detected in the investigations and he was given some medications for symptomatic management. As no relief was noted, the patient took an Ayurveda consultation. After clinical evaluation, the patient was advised to perform an X-ray of the cervical spine and was diagnosed with congenital block vertebrae at C3 – C4 vertebral bodies and posterior appendages with hypoplastic intervening disc space. He was advised to take Ekangveerarasa 250 mg BD before food with honey, Trayodashang guggulu 1 gm BD after food, Vishatinduka vati 250 mg BD after food, Aswagandha churna 3 gm BD after food with milk.The patient was also advised to do light massage and mild hot fomentation in the neck region twice a day with Mahavishagarbha oil. Remarkable relief was observed with all signs and symptoms including a reduction of score in the Neck Disability Index (NDI) within a very short duration of treatment. Considerable improvements were noted in the quality of life of the patient as confirmed by the WHO QOL BREF score. This case report shows that Ayurveda can offer safer and more effective symptomatic treatment for conditions like congenitally fused vertebrae.

1. Introduction –

Fused cervical vertebrae (FCV) also known as block vertebrae is a very uncommon condition, which can be both congenital and acquired. It has an incidence rate of 0.4–0.7% and the majority of patients remain asymptomatic until they reach the third decade of life. Congenital FCV (CFCV) is primarily associated with malformations in Chorda dorsalis. Acquired conditions are synostosis developed secondary to tuberculosis, juvenile rheumatoid arthritis, repeated trauma, and conditions like Kippel-Feil syndrome. Notable symptoms of CFCV include restricted neck movement with intermittent head and neck pain. Individuals with block vertebrae may be clinically silent at an early age but with the advancement of age, it causes degenerative arthritic changes in non-segmented cervical regions above and below the fused cervical region. At times, it causes compression of nerve roots resulting in hypoesthesia, webbed neck kyphosis, and paralysis of the concerned part of the body. Studies suggest that CFCV is a major predisposing risk factor for the development of cervical myelopathy [1–4].

Early detection of CFCV which is asymptomatic happens coincidentally during X-ray examinations for orthodontic and orthopedic purposes. Conventional management of the condition includes lifestyle modifications, avoiding traumatic injuries to the head, neck, and extensive rotation of the head and thereby preventing aggravation. Surgical corrections of CFCV are quite complicated and have a high risk of morbidity and mortality. Non-surgical approaches like the usage of cervical collars, traction, and physiotherapy are much preferred for symptomatic management. To manage the symptoms of pain NSAIDS, steroids are also prescribed. But these drugs have many side effects like gastritis, gastric ulcer, headaches, drowsiness, dizziness, hepatic toxicity, renal toxicity, hyperglycemia, allergic reactions, etc on chronic use [5]. Hence there is more scope for safer and more effective alternative approaches like Ayurveda in such conditions. Ayurvedic

Peer review under responsibility of Transdisciplinary University, Bangalore.
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https://doi.org/10.1016/j.jaim.2024.100964
Received 31 March 2022; Received in revised form 16 July 2022; Accepted 2 May 2024

Table 1
(Time line of disease activity with intervention).

Timeline	Clinical events and intervention
July 2020	The patient started suffering from pain in the neck, vertigo, difficulties in an upright posture, and imbalance gait and went allopathic hospital for consultation. On advice, the patient went through MDCT scan and Audiometric test but reports were normal and the patient was on conservative treatment. The patient didn't get relief and the severity of the above feature increased and lead to an almost ambulatory condition for the patient.
September 2020	The patient came for Ayurveda treatment, advised for x-ray cervical and congenital fused C3–C4 vertebrae were observed but the patient didn'ttake Ayurveda treatment
October 2020	The patient continued several Allopathic treatments
April 2021	The patient again came for Ayurveda treatment with a history of continuous pain, vertigo, and imbalance gait even with continued allopathic medication.Tab Vestizac-30, cap Actiphase DSR -20, Cap Ato Z gold.
April 2021	Considering the symptoms of neck pain, radiating pain in bilateral hands, vertigo, dysphagia, and difficulty in maintaining upright posture, patient was prescribed Ayurveda medicine: 1 Ekangveer rasa 2 Trayodashang guggulu 3 Visha tindukavati 4 Aswagandha churna 5 Mahavishagarbha oil (topical application with light massage and followed by hot fomentation in the neck)
June 2021	Relieved from maximum signs and symptoms, Improvement in Neck Disability Index score and WHO QOL BREF score with continued Ayurveda medication for 3 months
June 2021	**Having relief from symptoms patient discontinued medicine from june2021 to august 2021**
August 2021	Again on aggravation of symptoms like mild pain in neck radiating towards bilateral hand, occasional headache patient came for consultation and advised with the same medication which continued for 3 months
October 2021	Relieve in all symptoms complained in past 3 months, Improvement in Neck disability Index score and WHO QOL BREF score
October 2021	Patient advised for CBC, LFT, RFT, and toxic element test and all reports found to be normal
November 2021	Patient discontinued all medicines and it was decided to continue the same medicines if symptoms persist again.

medicines can offer symptomatic relief and enhance the quality of life of FCV patients. Here we report a case of CFCV, who got considerable symptomatic relief with Ayurvedic management.

2. Patient information

A 42 years old male patient attended OPD, Central Ayurveda Research Institute, Kolkata with two months history of neck pain, radiating pain in bilateral hands, vertigo, dysphagia, difficulty in maintaining upright posture. Patient had no significant past history of any illness relevant to this disease and any other chronic or systemic illness. Before attending this hospital the patient was treated for the same illness from other hospital. The patient was gone through MDCT (Multidetector Computed Tomography) scan, ENG test Audiological evaluation under previous consultation; however no abnormality was diagnosed in those tests. The patient was symptomatically treated with allopathic medicines and didn't get any significant relief. Further under Ayurveda consultation the patient was advised for X-ray of cervical region (AP & L view). In digital X ray congenital block vertebrae at C3 – C4 vertebral bodies and posterior appendages with hypo plastic intervening disc space was diagnosed.

A 42 years old married male patient approached OPD, Central Ayurveda Research Institute, Kolkata in September 2020 with a history of severe neck pain, vertigo, and difficulties in maintaining upright posture for two (02) months. By profession, he was involved in a desk work job with no history of any addictions. No family history significant to this disease was reported by the patient. He took an allopathic consultation for the complaints in July 2020 and was advised to do MDCT scan of the brain, ENG (Electronystagmography) test Audio logical evaluation, and hematological investigations. No abnormality was detected in those tests and was prescribed some allopathic medicines for symptomatic management.The patient didn't get any significant relief and decided to take an Ayurveda consultation.

Table 2
Details of Ayurvedic medicines prescribed.

S. N.	Prescribed medicines	Dose	Adjuvant
1.	Ekangveer rasa	250mg BD before food	Honey
2.	Trayodashangguggulu	1 gm BD after food	Warm water
3.	Vishatindukavati	250 mg BD after food	Water
4.	Aswagandhachurna	3 gm BD after food	Milk
5.	Mahavishagarbha oil	Topical application of oil with light massage in neck	Hot fomentation

3. Clinical findings –

During the consultation, the patient complained of neck pain radiating to bilateral hands with vertigo, dysphagia, and difficulty in maintaining an upright posture.The patient was conscious, oriented, and well responding to oral commands. Earlier the patient had done MDCT scan of the brain, hematological and Audiometric tests and all reports were normal. On examination, his blood pressure was 118/76 mmHg, pulse 68/min.There was no history of any systemic illness.The cardiac, neurological, and abdominal examinations were also unremarkable. After consultation, the patient was advised to take an X-ray of the cervical region (AP & L view). In digital X-ray congenital block vertebrae at C3 – C4 vertebral bodies and posterior appendages with hypoplastic intervening disc space were diagnosed. But the patient didn't take any Ayurvedic medications as he thought congenital conditions could not be managed by Ayurveda. He continued with several allopathic conservative management but didn't get any marked relief. So again he visited our OPD for Ayurveda management, while he was still taking some allopathic medications for pain management. He was advised to stop all allopathic medications and continue Ayurvedic medications as prescribed.

4. Timeline –

5. Diagnostic assessment

For the presenting complaints the patient was gone through MDCT (Multidetector Computed Tomography) scan of brain, ENG (Electronystagmography) test Audio logical evaluation under previous consultation; however no abnormality was diagnosed in those tests. Further under Ayurveda consultation the patient was advised for X-ray of cervical region (AP & L view). In digital X ray congenital block vertebrae at C3 – C4 vertebral bodies and posterior appendages with hypo plastic intervening disc space was diagnosed. Considering the signs symptoms and site, the features of the disease, it was treated as Asthimajjagata vata

dusti. Vata resides in skeletal tissue (Asthidhatu). Asthi-majjagata kshaya is one of the causes of Vata disorder (neurological illness and depletion affecting the bone segments, tissue, and marrow). Shoola (pain) accompanied by Stambha (fused vertebrae) suggests the presence of Vata and Kapha doshas. Though it is congenital anomaly the onset of symptoms at this age is considered to be due to desk work stress with posture defect which leads to vitiation of vata dosh and vitiated Vata dosha affects Asthidhathu (skeletral system). According to Ayurvedic principles, the patient was diagnosed and treated on the line of Asthi-majjagata vata dusti. On the basis of congenital illness the disease was determined to be Yapya (treatable under continuous consultation), and a treatment plan was devised accordingly.

6. Therapeutic intervention

Under previous consultation patient was advised Tab Vestizac-30, cap Actiphase DSR -20, Cap Ato Z gold. But patient did not find any significant symptomatic relief. As the patient condition was gradually deteriorated and routine work hampered, patient came for consultation under Ayuveda system of medicine. The patient was advised treatment as mentioned (Table 1 and 2).

7. Follow-up and outcomes

Initially patient was prescribed with the medicine for one month. Patient received marked relief within the one month of treatment but continued the medicine as it is congenital deformity. Before starting the Ayurvedic treatment patient was examined and assessed with scoring system by using Neck disability index.At the baseline of the Ayurveda treatment the score was 72% and after third month of treatment patient was again assessed with the same NDI scoring system and score was recorded as 14%. Patient got relief from all major discomforts and was able to perform all his routine work. All the medicine discontinued but again after 3 months (around 180 days from the baseline) patient again came with complaints of neck pain, diffictultis in performing routine wotk etc and his NDI score was recorded as 28%. Patient advised to continue the same medicine. After 3 months intake of medicine patient got relief from all major symptoms and his NDI score was recorded as 10 and he was advised to stop the medication.

Patient was also assessed with WHO Quality of Life BREF score before and after Ayurveda treatment.The WHO QOL-BREF is a self-administered questionnaire that includes 26 items on an individual's wellbeing in the past two weeks. Questions are answered on a 1–5 Likert scale, with 1 indicating "disagree" or "not at all" and 5 indicating "completely agree" or "extremely." Physical health, psychological health, social relationships, and the environment are the four dimensions included [4].

As per records of WHO QOL BREF before treatment, patients Physical score was 31%, Psychological health 44%, social relationship 56% and Environmental health score 56%. The score recorded 90 days post treatment were Physical score was 69%, Psychological health 63%, social relationship 75% and Environmental health score 69%. It is observed with both the assessment score of NDI and WHO QOL BREF that patient had achieved noticeable improvement. Most of the complaints like vertigo and dysphagia were also completely resolved. The patient is still continuing under treatment and had no features of any symptomatic adverse reaction.

To assess any adverse reaction of drugs, investigations like LFT, RFT investigation done after 6 months continuation of medicine. Ekangveer Ras is a Herbo mineral medication, and it contains bhasma as a component. The major bhasma components include Vang bhasma (tin), Abhrak bhasma (mica), Lauh bhasma (iron), Shuddha Gandhak (sulphur), Ras Sindoor (Mercury and sulphur), Tamra bhasma (copper), Naga Bhasma (lead). Since the patient was on this medication for about 6 months so heavy metal contamination was a possibility. To cross check the toxicity, heavy metal analysis was done in the patient after treatment. But after obtaining analytical report these heavy metals were within normal limits. Hence, quality and safety profile of treatment is assured.

Table 3
Post Treatment Blood Investigation

Investigation	Test name	Value	Ref range
Liver Function Test	Bilirubin-direct	0.21 mg/dl	<0.3
	Bilirubin-Total	1.19 mg/dl	0.3–1.2
	Bilirubin (Indirect)	0.98 mg/dl	0–0.9
	Aspartate Aminotransferase (SGOT)	27.3 U/L	<35
	Alanine Transaminase (SGPT)	43.5 U/L	<45
	Alkaline Phosphatase	65 U/L	45–129
	Gamm Glutamyl Transfrase	19.6 U/L	<55
	Protein Total	7.47 gm/dl	5.7–8.2
	Albumin Serum	4.17 gm/dl	3.2–4.8
	Serum Globulin	3.3 gm/dl	2.5–3.4
	Serum A/G Ratio	1.26	0.9–2
Renal function test	Serum Creatinine	0.75 mg/dl	0.6–1.1
	Blood Urea Nitrogen (BUN)	12.73 mg/dl	7–25
	BUN/Sr. Creatinine Ratio	16.97	9:1–23:1
	Uric Acid	4.8 mg/dl	4.2–7.3
	Calcium	9.37 mg/dl	8.8–10.6
	Est. Glomerular filtration Rate (eGFR)	113 ml/min/ 1.73 m^2	≥90
Toxic Elements Hemogram	Arsenic	1.72 µg/l	<5
	Cadmium	0.42 µg/l	<1.5
	Mercury	1.92 µg/l	<5
	Lead	102.45 µg/l	<150
	Thallium	0.02 µg/l	<1
	Uranium	0.03 µg/l	<1
	Aluminium	7.61 µg/l	<30
	Manganese	11.68 µg/l	1.10–20

The reports were as follows in Table 3.

Any Adverse event: No adverse affect was observed in patient during the Ayurvedic treatment.

8. Discussion

The abnormal cervical fusion can result in early degeneration and leads to cervical spinal deformity. In conventional system of medicine the common medications used for this condition include non-steroidal antiinflammatory medication (NSAIDs), muscle relaxants, neuromodulating medications (pregabalin, gabapentin, antidepressants) and other medicines such as acetaminophens. Other treatment options include physical therapy, chiropractic care, cervical traction, bracing, and Epidural injection therapy. The reasons to consider surgery include: progression of disability and impairment in quality of life after failure of conservative treatment, worsening deformity where neck positioning results in inability to look straight ahead or results in problems with swallowing. Though the frequency of Cervical deformity is very low, it can cause discomfort as well as difficulty with daily tasks such as eating, moving and keeping an upright position.

Chronic use of steroids and analgesics may lead to untoward effect, so a treatment with minimal side effect is need of the hour. To manage the symptomatic cervical anomaly condition and to prevent worsening the condtion towards cervical deformity, in Ayurveda the case was dealt with some conservative symptomatic treatment with Ayurveda medicine. The patient was managed on the line of *Asthimajjagatavata.*

By considering the condition, patient was treated with Trayodashang guggulu [6] 1 gm BD after food,Vishatindukavati 250 mg BD after food, Ekangveeraras 250 mg BD before food with honey, Aswagandhachurna 3 gm BD after food with milk and Mahavishagarbha oil for local application twice a day. It was observed that the patient got relief from all discomfort with 3 months intake of medicine. But when he stopped all medication the sign and symptoms aggravated after around 3 months.

Patient again advised to continue the medicine for 3 months and got relief from all discomfort. So it was decided to continue the same medication for around 2–3 months on aggravation of signs and symptoms.

The drug Trayodashanga Guggul is a combination of 13 herbs including Guggulu (Commiphora mukul) processed in ghee. The constituents like Shatavari, Ashwagandha, and Guduchi are known as rejuvenators and provides strength to Dhatus (Body vitals in Ayurveda). Shunthi and Ajamoda helps to improve Jatharagni (Digestive fire) whereas Babbul is especially acting on Asthidhatwagni (Metabolism related to bone). Ghee helps in better absorption and penetration of the drug. Thus, Trayodashangguggulu directly impacts on the etiology of ManyagataVata (factors related to neck pain) and helps in the disintegration of the pathogenesis and settles down the vitiated Vata dosha. They were also act as Vatanulomaka, Vatashamaka and Vedanasthapaka. In ManyagataVatavyadhiVataprakopa, dhatukshinata, Dhatu rukshata, Parushata, Asthidhatukshaya generally founds. The contents of TrayodashangGuggulu were mainly Guru, Snigdhagunatmak, Madhur rasa, Madhur vipaki and Ushnaviryatmak in properties, which acts as pain relieving factor. *TriyodashangaGuggulu* is useful in *Snayugatavata* (various tendon and ligament disorders), *Asthigatavata* (disorders of bone), *Majjagatavata* (disorders of bone marrow), *Khanjavata* (limping disorders), and various *Vata*disorders (neurological, rheumatic, and musculoskeletal diseases) [7].

Strychnous nuxvomica is the main ingredient of Vishatinduka vati. Vishtinduk vati is a nervine as well as cardiac stimulant drug. It shows beneficial effect on treating neuralgia, facial paralysis, and local paralysis. It contains analgesic properties.[5]Analgesic and anti inflammatory activity of strychnous nuxvomica action is inhibitory action on the synthsis and/or release of inflammatory mediators such as PGE2, TNFα and thereby reduces pain and writhing behavior [8].

Ekangveer Ras is a Herbo mineral medication, and it contains bhasma as a component. Bhasma-based medicines are the most effective kind of medicine. Bhasma is the most ancient method for administering nanomedicine. Ekangveer Rasa is an Ayurvedic drug used mostly to treat paralysis, sciatica, and facial paralysis. The major components include Chitrak, Amla, Bhringaraja, Dhatura, Kushta, Black Pepper, Pippali, Ginger, Trikatu, Triphala, Vang bhasma, Abhrak bhasma, Lauh bhasma, Shuddha Gandhak, Ras Sindoor, Tamra bhasma, Naga Bhasma. The properties of ingredients of EkangveerRas would be helpful in restoring the Gati (motor activities) and Gandhana (Sensation) [9]. Severe chronic pain persistent to neuralgia and the symptoms pertaining to it was drastically resolved with this Ayurveda medication [10]. Since the patient was on this medication for about 6 months so heavy metal contamination was a possibility. Later on, to cross check the toxicity, heavy metal analysis was done. It is seen that toxic metals such as lead, mercury, cadmium and/or arsenic are usually found in herbomineral preparation. But after obtaining analytical report these heavy metals were within normal limits. Hence, quality and safety profile of treatment is assured.

Ashwagandha or Indian ginseng is the common name for *Withania somnifera* (Solanaceae). For almost 3000 years, it has been utilized in Ayurvedic and indigenous medicine. *W. somnifera* root powder reduces arthritic symptoms in collagen-induced arthritic mice by acting as an anti-inflammatory and antioxidant agent [11]. *W. somnifera* 250 mg group demonstrates pain-relieving and anti-inflammatory properties. The entire research medicines were well endured, with just a few individuals experiencing moderate gastrointestinal side effects such as nausea and gastritis. The aqueous extract of *W. somnifera* reduced conclusive variables significantly among them the group with dosing pattern of 250 mg responded much superiorly. Furthermore, the curative effects emerges to be dependent on dose and devoid of major Gastro Intestinal problems [12].

Mahavishagarbha oil is a classical drug used in several vata diseases like paralysis, neck stiffness, hemiplegia, lock jaw, tremor etc. In one of the case after using mahavishagarbha oil for one month, patients suffering from cauda equina had considerable alleviation in terms of pain severity, bladder control, improvement in motor power, walking ability, and straight leg raising test (SLRT). Mahavishagarbha oil can alleviates the symptoms of pain related to disc fusion [13].

9. Conclusion

Based on the clinical features the patient treated with Ayurvedic medicine shown appreciating result with 3 months of treatment. As it is a congenital problem patient is still continuing the treatment in off and on mode under strict supervision assessing the adverse effects. Though it's a rare case it becomes difficult to find more cases to see the effectiveness of treatment in large scale. More studies can be done in any congenital block vertebrae anomaly with the followed treatment protocol. It is bliss to achieve relief and enhance quality of life through Ayurvedic intervention in congenital anomaly where treatment is riskier in modern management or surgery.

Author Contributions

Treated the case-RE; Conceptualization-RE, SB; Drafting the article: EE, SB; Analyzing the medical intervention-PGN, RE; Revising it critically-RE, SB; Final approval of the version to be submitted-AKD, PVVP.

Sources of funding

Nil

Patient perspective

The patient was fully satisfied as patient was suffering a lot for 2 months even after taking Allopathic medicines. Patient responded well to the prescribed Ayurveda medicine with healing of all discomforts within a very short period.

Informed consent

The patient informed consent have taken before making this article.

Declaration of competing interest

Authors declares no conflict of interest.
Declaration of Generative AI in scientitic writing
None

Acknowledgement

We would like to thank our patient, who consented to have his case presented and published.

We are thankful to OPD of Central Ayurveda Research Institute, Kolkata for providing the medicine free of cost for our patient.

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