

Case Report

Ayurvedic insights into the early pathogenesis and management of ankylosing spondylitis: a case report

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ABSTRACT

Ankylosing spondylitis is a chronic seronegative inflammatory arthritis that mainly affects the sacroiliac joints and spine, potentially leading to spinal fusion. Conventional treatments like NSAIDs, DMARDs, and TNF- α inhibitors help manage pain and inflammation but do not provide a cure. In this case, a 37-year-old male patient admitted in the kayachikitsa inpatient department of Vaidyaratnam Ayurveda College, Ollur on 02/01/24 with pain and restricted movements of neck, swelling with pain on right knee joint and low back ache. He was diagnosed as ankylosing spondylitis (Sandhigata vata) as per Modified New York Criteria for Ankylosing spondylitis (AS) and including the clinical presentation, physical examination, laboratory tests. He underwent treatment protocol of vatavyadhi chikitsa. Ayurvedic preparations like chitrakadi kashayam, maharasnadi kashayam, chandraprabha gulika, vettumaran gulika, shaddharanam choornam were given internally. Dhanyakizhi, lepanam, dhanyamla dhara, abhyangam were given as external therapy. Visual analogue scales for pain, range of movements, Bath Ankylosing Spondylitis Disease Activity Index (BASDAI), Ankylosing Spondylitis Disease Activity Score using ESR (ASDAS-ESR), AMA assessment tool were used to evaluate the effectiveness of the treatment. After the treatment, the patient got relief of pain, considerable improvement in range of motion of cervical spine, swelling and pain on right knee joint reduced. This case study highlighted that within 2 weeks, restricted movements of neck got considerable improvement and ankylosing spondylitis disease activity score using ESR (ASDAS-ESR) decreased significantly by conservative ayurvedic management only.

Keywords: Ayurveda, Sandhigata vata, Ankylosing spondylitis, Vatavyadhi chikitsa

INTRODUCTION

Ankylosing spondylitis (AS) is a long-term, progressive inflammatory condition that mainly involves the axial skeleton, especially the sacroiliac joints and spine. It is classified under seronegative spondyloarthropathies and most often affects young adults, with males being more commonly affected than females. The prevalence is 0.1-1.4% in global population.¹ The cause of AS is complex and involves a combination of genetic predisposition, environmental influences, and immune system factors. A strong link exists between AS and the HLA-B27 gene, with about 90-95% of patients testing positive for this

marker. The disease usually begins at the entheses, which are the sites where tendons and ligaments attach to bones, leading to inflammation referred to as enthesitis. Over time, this can lead to the development of bony growths called syndesmophytes and eventual fusion of the spine, a condition known as ankylosis.² Diagnosis of Ankylosing Spondylitis (AS) involves a combination of clinical evaluation, imaging studies, and laboratory tests. The Modified New York Criteria (1984) is commonly used as diagnostic criteria for AS, includes signs such as chronic inflammatory back pain, reduced spinal flexibility, and limited chest expansion, and radiographic evidence of sacroiliitis.³ Laboratory tests often include HLA-B27

genetic testing, which is positive in most AS patients, though it is not solely diagnostic. Inflammatory markers like C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR) may also be elevated, supporting the presence of active inflammation.⁴ Gatavata is a condition described in Ayurveda where the vitiated Vata dosha localizes in the joints (sandhi) and other structures of the body, leading to symptoms such as pain, stiffness, swelling, and restricted movements. It is considered a type of vata vyadhi⁵. Ankylosing Spondylitis (AS), a chronic inflammatory disorder primarily affecting the axial skeleton and sacroiliac joints, can be correlated in Ayurveda with a multi doshic manifestation of vata vyadhi, predominantly involving asthigata vata, majjagata vata, mamsagata vata, and sandhigata vata. The progressive degeneration, pain, stiffness, and eventual fusion of spinal joints observed in AS resemble asthi and sandhigata vata, where vitiated vata causes structural deformities and joint immobility. The deep-seated nature of the disease and involvement of bone marrow (majja) aligns with majjagata vata, manifesting as chronic inflammation, fatigue, and radiating pain. Additionally, mamsagata vata can be inferred from the associated muscle wasting, stiffness, and pain around the paraspinal and peripheral musculature.

Thus, AS is a complex vata dominant disorder affecting multiple dhatus and sandhi's. In this case the vitiated vata located in the sandhi. So, it can be correlated with sandhigata vata, resulting in sandhishoola (joint pain), sandhishotha (swelling), and hanti prasarana achunchana pravrutti (restricted joint movements). The underlying pathology of Sandhigata Vata involves vitiation of vata dosha due to dhatu kshaya (tissue degeneration) and margavarana (obstruction in the body's channels), which can be correlated to the autoimmune and inflammatory mechanisms, as well as syndesmophyte formation seen in AS.⁶ Here the symptoms of AS were managed significantly through snehana, swedana, and internal vata-shamana Ayurvedic therapies. This can reduce further progression of the disease. The patient experienced notable relief in pain, stiffness, and mobility restrictions.

CASE REPORT

A 37-year-old male patient with the following presenting complaints was admitted to our hospital on 02 January 2024 for 15 days and discharged on 17 January 2024. Primary concerns and symptoms of the patient.

Pain and restricted movements of neck for 2 months. Pain and swelling on right knee joint for 2 months. Low back ache while sitting for a long time for 2 years.

A 37-year-old male patient visited the *Kayachikitsa* Outpatient Department at Vaidyaratnam Ayurveda College, Ollur, with complaints of pain and restricted neck movements persisting for the past two months, along with pain and swelling in the right knee joint during the same period. He reported a previous episode of neck pain six

months ago, which was aching in nature, had a gradual onset, and was accompanied by morning stiffness that improved with neck movements. At that time, he underwent Ayurvedic treatment from a local centre, including internal medications for three months, which provided significant relief, prompting him to discontinue the medications. However, over the last two months, he experienced a recurrence of neck pain, with increased restriction of movement and morning stiffness. Concurrently, he developed right knee pain with intermittent swelling, characterized by periods of relapse and remission. Additionally, he reported mild aching pain in the lower back, particularly noticeable after prolonged sitting, a routine part of his job for the past two years. Since the pain would ease with activity, he had largely ignored it. Initially, he sought treatment at the OP department of Vaidyaratnam Ayurveda College and received two weeks of Ayurvedic medication, after which he was admitted to the *Kayachikitsa* inpatient department for further management.

Patient follows a mixed diet with intake of sweets, and spicy foods. Bowel was regular, once daily, satisfactory evacuation, and formed stool. Appetite was regular. Micturition was regular. Sleep was reduced to 4 hours at night, and no day sleep was present, owing to the demands of his occupation, he habitually maintained a prolonged seated position with his neck in a forward-flexed posture. Had no positive history suggestive of allergy, and addictions were present in this case.

There was a significant family history of arthritis, as both the patient's mother and brother have been diagnosed with rheumatological conditions. Psychosocial history showed cooperative behaviour. Occupational history was welder. Socioeconomic status was lower middle class (Modified Kuppuswamy SES scale 2021). Relevant past interventions with outcome was in pursuit of relief from neck pain, he undertook a three-month course of Ayurvedic internal medication at a traditional healing centre during August, September, and October 2023.

General examination

The patient was of Moderate build, nourished moderately with a height of 174 cm and a weight of 71kg, BMI of 23.45 kg/m². Appearance was neat and tidy with a mild stooped neck posture, and mild thoracic kyphosis. As for vitals, the pulse rate was 76 beats/min, the respiratory rate was 17 breaths/min, and the blood pressure was 100/70mm Hg. The patient was cooperative, oriented to time, place, and person, and intelligent.

Systemic examination

On examination, the respiratory, gastrointestinal, and cardiovascular systems were found to be normal. However, abnormalities were observed in the locomotor system.

Examination of the locomotor system

On examination of cervical spine, mild swelling was present over the nape of the neck, and on palpation, there was tenderness grade 1 over C5, C6, C7 spinous process and no warmth was present. all the movements of cervical spine were restricted with pain (Table 1). For the thoracic spine, on palpation tenderness grade 1 was present over T4, T5 spinous process. And for the lumbar spine all the movements within normal limits with mild catching pain were present. Schober's test was negative (21 cm).

For the knee joint, on inspection swelling and warmth was present on right knee with mild pain on flexion and extension of the joint. For the sacro-iliac joint, tests including the Pump handle test, Faber's test and Gaenslen's test were negative bilaterally.

Cervical spine range of motion (ROM in degrees) (Table 1)

Tendons

Thickening, localised swelling, tenderness, rupture, and functional abnormalities were absent for the tendons. Reflexes- superficial reflex – corneal was intact bilaterally, and plantar reflex was intact b/l (+), Deep tendon reflexes, including Biceps, knee, and ankle jerks, were intact (+) bilaterally.

Sensory system

Superficial sensations, including pain, touch, temperature; deep sensations, including vibration, proprioception; cortical sensations, including two-point discrimination, stereognosis, graphaesthesia, were found to be intact bilaterally.

Ayurvedic diagnostic assessment

AMA assessment score found to be 20. Indicating moderate level of AMA.⁷

Table 1: Cervical spine range of motion (ROM in degrees).

Variables	Active ROM	Special test
Flexion	30°	Spurling's test- couldn't be elicited due to restricted movement of spine.
Extension	30°	
Left lateral bending	20°	
Right lateral bending	20°	Lhermitte's sign- couldn't be elicited due to restricted movement of spine.
Right rotation	30°	Flesche test (occiput to wall distance)- 1 cm
Left rotation	40°	

Ayurvedic diagnostic assessment (Table 2)

Nidana

Aharajam

It includes intake of sweets, and spicy foods excessively.

Viharajam

It constant sitting in head stooped posture as part of his job, and reduced sleeping hours (4 hrs at night).

Manasika

It was nil.

Poorvaroopo

It was avyaktham.

Roopa

Swelling over nape of neck, right knee joint (sopham over sandhi), Pain with restricted movements of neck (prasarana akunchanayo pravuti sa vedana)

Samprapthi

Vatha vardhaka nidanas and Kapha dushti, Sthanasmraya in greeva, janu, katee and Produces symptoms like Prasaranakunchanayo pravrti savedana, sandhi sopham.

Upasayam

It was ushna sigdha.

Anupasayam

It was sheeta rooksha.

Diagnostic assessment

This case was diagnosed as a case of ankylosing spondylitis based on criteria for ankylosing spondylitis by ASAS classification criteria for axial spondyloarthritis and Modified New York Criteria for Ankylosing Spondylitis and including the clinical presentation, physical examination, laboratory tests.^{8,9} ASAS classification criteria for axial spondyloarthritis criteria namely, chronic back pain>3 months, under 45 years old, HLA-B27 positive, with 2 clinical features- elevated CRP level, arthritis. Modified New York Criteria for ankylosing spondylitis namely, low back pain and stiffness for more than 3 months, which improves with exercise, but is not relieved by rest. Sacroiliitis on imaging (grade 2 right side, grade 1 left side). Laboratory investigations revealed elevated ESR and CRP levels, and HLA-B27 was found to

be positive on 04 January 2024, as tested in Vaidyaratnam Ayurveda College Hospital. Reactive arthritis is excluded as there is no history of previous infection before the onset of symptoms. All suggestive of the diagnosis of ankylosing spondylitis.

Table 2: Ayurvedic diagnostic assessment.

Prakriti	prakriti (TNMC prakriti questionnaire)
Doshas vitiated	Vyana vayu, shleshaka kapha
Dhatu	Asthi, majja
Upadhatu	Kandara, snayu
Sara	Madhyamam
Samhananan	Madhyamam
Satvam	Madhyamam
Satmyam	Madhura, Katu
Srotas affected	Asthivaha, majjavaha,
Pramanam	Madhyamam
Aharasakthi	Madhyamam
Vyayama Sakthi	Madhyamam
Vaya	Madhyamam
Kalam	Kshanadhi-hemantham Vyadhavastha-navam
Desham	Bhoomi-deham-sandhi
Bhumi	sadharanam
Rogamargam	(asthi sandhi) madhyamam

Investigations

Blood reports were HLA-B-27 was positive on 04/01/24, CRP-48, ESR-57 mm/hr (Figure 1).

NAME	██████	COLLECTED ON	04-Jan-2024 02:31 pm
LAB NO.	HYGA-115812	RECEIVED ON	04-Jan-2024 03:11 pm
AGE/SEX	37 Years / Male	REPORTED ON	06-Jan-2024 11:56 am
PH NO		REFERRED BY	Dr. NAVANEETH
IP/OP		CORPORATE	VAIDYA RATNAM AYURVEDA HOSPITAL
Test Description	Results & Unit	Reference Value	Sample Type
IMMUNOLOGY			
HLA-B 27 - FLOWCYTOMETRY	Positive	100%	
Note: Requested the physician to interpret the results with clinical significance. Technology used: Flowcytometry Remarks: *The given sample may be homozygous for HLA-B*27 allele. *Requested the physician to interpret the results with clinical significance. Interpretation: There is strong association between the presence of HLA-B*27 antigen and an increased incidence of ankylosing spondylitis (AS) as well as other disorders, such as Reiter's Syndrome, psoriatic arthritis and enteropathic associated with inflammatory bowel disease. These disorders are collectively called Seronegative spondyloarthritides. HLA-B*27 positive patient is more likely to exhibit spondyloarthritides.			

Figure 1: Result of positive HLA-B-27.

Imaging techniques

X ray cervical spine on 22 December 2023 (Figure 2).

It appears to be loss of normal cervical lordosis. mild anterior osteophytic changes (bony outgrowths) are seen, particularly around the lower cervical vertebrae (C5-C7). Marginal osteophyte formation and possible early syndesmophyte like changes can be noted at the lower

cervical vertebral levels. X-ray was thoracolumbar spine and pelvis on 22 December 2023 (Figure 3). Sacroiliitis grade was 2 on right, and grade 1 on left.



Figure 2: X-ray cervical spine (lateral view).



Figure 3: X-ray thoracolumbar spine and pelvis (AP view).

Therapeutic interventions

The treatment aimed to relieve the pain and increase the range of motion cervical spine and relieve swelling and prevent further damage and improve the quality of life of the patient. Considering the patient's presentation with classical features of *Ama*, the therapeutic approach was initiated with *dipana* and *ama pachana* interventions. Subsequently, treatment was aligned with the principles of *Vatavyadhi Chikitsaa*. Internal medications were

commenced on the day of admission (Table 3), followed by the initiation of external therapies on the subsequent day (Table 4). The patient was admitted to our hospital for a total of 15 days and underwent *ruksha swedana* (sudation), *snigdha swedana* and *snehana* (oleation) therapies during the treatment.

Table 3: Internal medicines.

Date	Medicine	Dosage	Time
02/01/24 to 17/01/24	<i>Chithrakadi kashayam</i>	15 mks +45 ml lukewarm water	Before food, 6 am, 7 pm
	<i>Chandrapraba Gulika</i>	1-0-1	With <i>kashayam</i>
	<i>Vettumaran Gulika</i>	1-0-1	After food with ginger juice and honey
	<i>Shaddharanam choornam</i>	1 tsp	At 11 am with hot water

Table 4: External therapies.

Date	Procedure	Medicine	Remarks
03/01/24 to 05/01/24	<i>Choorna pinda swedam</i>	<i>Nava Dhanyam</i>	Whole body
03/01/24 to 09/01/24	<i>Lepanam</i>	<i>Nagaradi choornam +kottam chukkadi choornam in dhanyamla</i>	over nape of neck, right knee joint
06/01/24 to 08/01/24	<i>Avikizhi</i>	<i>Dhanya kizhi in dhanyamla steam</i>	Whole body
09/01/24 to 11/01/24	<i>Dhara</i>	<i>Dhanyamlam</i>	Whole body
12/01/24	<i>Sataila dhanyamla dhara</i>	<i>Ketakimooladi tailam</i>	Whole body
13/01/24 to 17/01/24	<i>Abhyangam</i>	<i>Ketakimooladi tailam</i>	Whole body

Advise on discharge

Maharasnadi kashayam- 15ml kashayam with 45ml lukewarm water, twice daily, before food, 6 am, 7 pm. Yogaraja guggulu-1-0-1 with kashayam, twice daily. Shaddharanam choornam- 1tsp with hot water at 11 am. Ketakimooladi tailam+murivenna-for external application. Following the course of treatment, the Visual analogue scale (VAS) score for pain showed a significant

reduction from 7 to 4. The Bath ankylosing spondylitis disease activity index (BASDAI) also improved markedly, decreasing from 5.9 to 2.2 (Table 5).¹⁰ The *Ama* score reduced from 20 to 4. Furthermore, the Ankylosing Spondylitis Disease Activity Score using ESR (ASDAS-ESR) decreased significantly, from 4.46 (very high disease activity) to 2.22 (high disease activity) (Table 6), signifying both subjective and objective therapeutic response.¹¹ The range of motion of the cervical spine also demonstrated observable enhancement (Table 7).

Table 5: The BASDAI.

Symptoms	Before treatment	After treatment
Fatigue	7	3
Neck pain, back pain and hip pain	8	3
Pain and swelling in other joints	4	1
Joint tenderness	5	2
Morning stiffness (intensity)	7	3
Morning stiffness (duration)	4	1

Table 6: ASDAS.

Symptoms	Before treatment	After treatment
Back pain	4	2
Duration of morning stiffness	8	2
Peripheral pain/swelling	6	1
Patient global assessment of disease activity	8	2
ESR (mm/h)	57	30

Table 7: Cervical spine ROM.

Variables	Active ROM(BT)	Active ROM(AT)
Flexion	30 ⁰	40 ⁰
Extension	30 ⁰	40 ⁰
Left lateral bending	20 ⁰	35 ⁰
Right lateral bending	20 ⁰	35 ⁰
Right rotation	30 ⁰	65 ⁰
Left rotation	40 ⁰	70 ⁰

DISCUSSION

Ankylosing spondylitis (AS) is a chronic, progressively worsening inflammatory condition that may result in structural deformities and loss of function over time. Although a complete cure is not currently available, timely diagnosis and sustained therapeutic management are essential for delaying disease progression. In this case of Ankylosing spondylitis, the patient presented with the symptoms of *sandhigatavata* associated with the *ama* symptoms. *Vata* vitiation was more pronounced in the

form of pain and restricted cervical spine movements. The treatment started by assessing the *ama*, *agni*, and *bala* of the patient. After reduction in ama symptoms he was administered with snehana and swedana therapies. Swedana, involves the application of therapeutic heat, which helps to relieve stiffness, reduce pain, and enhance circulation. Regular application of Sneha and Sweda in AS patients not only provides symptomatic relief but also supports long-term functional well-being. Snehana (oleation) and Swedana (sudation) play a vital role in alleviating the vitiated Vata dosha, which is considered the primary factor in the pathogenesis of AS. Snehana, helps in lubricating the joints, softening the stiff tissues, and facilitating the movement of toxins toward the gastrointestinal tract for elimination. It nourishes the dhatus (tissues), improves flexibility, and reduces dryness and degeneration in the joints.

The scientific rationale for the probable mode of action of procedures

The protocol commenced with pinda Sweda as the Vatadosha is here associated with kapha. Rooksha and ushna gunas of churna and swedana procedures are utilised to pacify both. The rooksha pinda sweda sweda kriya like dhanyakizhi increases blood flow, thus eases down the inflammation. The procedure reduces sotha (inflammation) in joints and soft tissues, particularly when kapha is also involved along with vata. Lepamam with nagaraadi Choornam and kottam chukkadi choornam over nape of neck and right knee helps to alleviate the inflammation, stiffness and joint pain in initial phase.^{12,13} Kottamchukkadi churna possess gunas like thikshna, ushna, kaphavata hara, sophagnam. followed by dhanyakizhi in dhanyamla steam (Avikizhi). Dhanyamla aids in pacifying ama, which often coexists with Vata vitiation. This makes dhanyakizhi particularly suitable in any vata disorder. Dhanya churna is moderately Snigdha so that it will not aggravate the vata dosha during the rookshana procedure. Dhanyamla dhara Continuous streaming of warm liquid stimulates circulation, opens channels, and helps remove obstructions in srotas, restoring functional integrity and brings about laghuta (lightness) in the body by relieving stiffness and heaviness caused by vata and kapha imbalance. Sataila dhanyamla dhara is a strategic and synergistic therapy that combines ama-pacana, vatahara, kapha hara, and bṛmhaṇa principles. It provides therapeutic warmth, deep tissue nourishment, and cleansing action, making it highly effective in managing chronic vatavyadhi, especially when accompanied by degeneration, stiffness, swelling, and ama. It helps in removing the muscle spasm and improving the movements and reducing the pain. Abhyanga with ketakimuladi taila¹⁴ serves as a potent external therapy in Sandhigatavata, offering pain relief, anti-inflammatory effects, nourishment, and restoration of joint function. The oil's composition, with its vatahara, sothahara, and snigdha properties, makes it particularly effective for dry, painful, and degenerative joint conditions. A physico-chemical analysis confirms the presence of active

compounds- such as flavonoids, anthraquinone glycosides, and steroids- that likely contribute to its anti-inflammatory, analgesic, and tissue-strengthening effects. This supports its use in degenerative and inflammatory joint disorders, typical of AS.

The scientific rationale for the probable mode of action of internal medication

Internally, chitrakadi kashaya was given in the initial stage, chitrakadi kaṣayam is a classical ama pacana and dipana pacana formulation primarily indicated in disorders where Ama (metabolic toxins) and vata doṣha are predominant. contains ingredients such as Chitraka (*Plumbago zeylanica*), Pippali (*Piper longum*), and Shunthi (*Zingiber officinale*), which help in rekindling the digestive fire (Agni), digesting Ama, and clearing srotorodha (channel obstruction). Its katu (pungent) and tikta (bitter) rasa, along with ushna virya (hot potency), assist reducing Ama, thereby relieving symptoms like inflammatory joint pain. Chandraprabha vati is a versatile and powerful Ayurvedic formulation with broad-spectrum activity.¹⁵ In the context of vata roga and arthritis, it offers anti-inflammatory, detoxifying, and rejuvenative effects. Its ability to target ama, vata, and meda simultaneously makes it a valuable internal medication in managing chronic joint diseases, especially when accompanied by digestive weakness or metabolic imbalances. Saddharaṇam churna is a classical Ayurvedic herbal powder formulation mentioned in Bhaishajya Ratnavali, primarily indicated in ama janya vikara, Agnimandya (low digestive fire), and vatavyadhi. It kindles agni, enhancing absorption of nutrients and medicines Clears ama, thereby reducing joint stiffness and pain.¹⁶

Vettumāraṇ gulika is a potent Ayurvedic formulation suited for complex vata disorders, especially when symptoms are compounded by ama, kapha, and impaired digestion.¹⁷ Its powerful combination of detoxifying, analgesic, and vata pacifying herbs makes it effective in relieving pain, stiffness, swelling, and digestive stagnation in chronic and subacute vatavyadhi presentations. Maharasnadi kashayam contains snigdha, ushna, vatasamaka dravyas which pacify the aggravated vata. Many ingredients like rasna, guggulu, and nirgundi reduce inflammation, swelling, and stiffness in vata vyadhi.¹⁸ Also, it promotes nourishment of muscles and nerves, counteracting degeneration. In yogaraja guggulu, guggulu is Potent anti-inflammatory and rasayana; rejuvenates joint tissues and removes ama.¹⁹ Yogarja guggulu is a potent Ayurvedic formulation that combines anti-inflammatory, detoxifying, digestive, and rejuvenative actions, making it highly effective in the management of vatavyadhi.

CONCLUSION

In this case 37-year-old male patient restricted movements of neck, swelling with pain on right knee, with HLA-B27 positive, the restricted movements of neck due to the sclerotic changes in cervical spine. The treatment protocol

of *vatavyadhi* followed in this case. In this case study, patient got satisfactory improvement in movements of neck functional improvement through two weeks of ayurvedic conservative management, and he continued the Ayurvedic internal medicines and passive exercises to maintain the posture and retain the flexibility of spine obtained after the treatment. AS is a progressive, chronic inflammatory disease that can lead to structural damage and functional impairment over time. While there is no definitive cure, early intervention and consistent management are crucial to slowing its progression. Ayurvedic treatments such as *snehana* (oleation), *swedana* (sudation), *lepana* along with internal medications, aim to pacify the vitiated Vata dosha, reduce inflammation, and improve joint mobility. These therapies, when administered appropriately, may help alleviate symptoms, prevent further deterioration, and enhance the patient's quality of life. Although clinical outcomes have shown promising improvements, more robust and scientifically structured studies are essential to confirm and standardize the effectiveness of Ayurvedic treatments in managing AS. There is a growing need for comprehensive research, including randomized controlled trials, to substantiate the role of Ayurveda as a complementary or alternative strategy in the integrated management of AS.

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