

CASE REPORT

The Return of a Forgotten Disease: Paediatric Scurvy in the Modern Era – A Case-Based Review.

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Abstract

Scurvy, a disease resulting from severe vitamin C deficiency, is considered a disease of the past. We encountered a case of paediatric scurvy in a previously healthy child from an affluent family, presented with gradually worsening bilateral knee and hip pain over 6 months, with inability to walk for the past 2 months without a history of trauma or falls. The clinical presentation of joint pain and muscle wasting mimicked several other conditions, particularly neurological and rheumatological disorders, leading to extensive blood investigations and imaging to determine the cause. High clinical suspicion of scurvy arose when all investigations and imaging were normal except mild hypochromic microcytic anaemia and poor diet history. This case report highlights the clinical presentation and challenges for early diagnosis and treatment in a low-risk population. It underscores the importance of a thorough dietary history and consideration of nutritional deficiencies among children with unexplained musculoskeletal symptoms.

Keywords: *Dietary history, musculoskeletal, scurvy, vitamin C deficiency.*



Introduction

Delayed diagnosis of scurvy is common due to the heterogeneous, non-specific presentation of early symptoms and its rarity in modern practice. Paediatric patients with very restricted diets, especially those with autism spectrum disorder, are at increased risk [1]. Accurate diagnosis requires meticulous clinical and dietary assessment, independent of comorbidities or socioeconomic background. Early diagnosis is critical, as vitamin C supplementation leads to rapid clinical resolution.

Case presentation

A 7-year-old girl with no underlying illness was brought to the paediatric outpatient clinic in March 2025, presenting with bilateral knee and hip joint pain, which gradually worsened over a period of 6 months, with the inability to walk for 2 months without a history of trauma or fall. She had no fever, gum swelling, or bleeding tendency. She is the youngest of six siblings. All her siblings have normal body mass index (BMI) and eat a balanced diet. Her father works as the head of audit in the government sector, and her mother is a manager in an insurance company, with a household income in the top 20% income group (T20) in Malaysia.

On systemic examination, she had mild pallor, no jaundice, and normal vital signs. Her weight was only 18 kg (at 5th centile), with a height of 1.25 m (at 75th centile), giving her a BMI of 11.52 kg/m² (below 5th centile), which falls under the category of severely underweight for her age.

Examination of the lower limbs revealed fixed flexion deformity of both knees (Figures 1 and 2). The range of motion of the bilateral hip joints was limited due to pain upon both active and passive movements. She also had bilateral lower limb muscle wasting (Figures 1 and 2). Otherwise, the bilateral knee and hip joints were not swollen, erythematous, or warm on palpation.

Blood investigations showed hypochromic microcytic anaemia with a haemoglobin level of 9.5 g/dL, with normal white blood cell and

platelet counts. Her renal profile, electrolytes, septic parameters, connective tissue disease screening, and liver function tests were all within normal limits.

Imaging was performed, including ultrasound of the abdomen and pelvis, and multiple X-rays of the bilateral lower limbs, which revealed normal findings. Subsequently, a magnetic resonance imaging (MRI) of the lumbosacral spine and lower limbs was done, which revealed bilateral knee synovitis with focal myositis of the surrounding muscles.

Further history revealed that she had a very restricted diet since the age of 5, consisting mainly of carbohydrates, such as plain bread, biscuits, noodles, and white rice. She ate fried chicken only 2 to 3 times weekly and refused all fruits or vegetables. Her fluid intake was limited to plain water, Vitagen, and strawberry-flavoured milk a few times per week.

Due to her alarming diet history, scurvy was highly suspected. Serum vitamin C level was taken and showed a markedly low level of < 0.1 mg/dL (reference range: 0.4–2.0 mg/dL).

She was started on vitamin C tablets 100 mg TDS (three times daily) for 2 weeks, then tapered to 100 mg BD (two times daily) for 1 week, and 100 mg OD (once daily) as maintenance. She showed marked improvement after 2 weeks and achieved full recovery after 1 month of vitamin C treatment and physiotherapy.

A repeat sample of the vitamin C level was not taken after treatment, as the patient clinically improved with the treatment. It is also very costly, as it has to be outsourced to a private laboratory. Her parents were advised to seek immediate treatment if the symptoms recur and to comply with a vitamin C supplement and vitamin C-rich food.

Discussion

In Malaysia, there is no comprehensive national data on scurvy incidence. Cases are rare and mostly documented through case reports.

However, international literature highlights that the condition still occurs and is rising in incidence, particularly among at-risk groups: children with a very restrictive diet, children with autism spectrum disorder, and children from the lowest income group [1].

Cases in adults are rare, and they are frequently associated with alcohol use disorder, psychiatric illness, malabsorption (e.g., from Crohn's disease, bariatric surgery), or social determinants of health like poverty and homelessness. Sporadic cases of adult scurvy were reported in psychiatric patients and in malnourished, alcoholic, homeless patients [2].

A study by the Friesland Campina Institute in 2022 found that most children in Malaysia meet the recommended nutrient intake (RNI) for vitamin C. The Southeast Asian Nutrition Surveys (SEANUTS) I is a large nutritional study conducted in several Southeast Asian countries in 2010–2011. The total study population consisted of 3,542 children aged 0.5 to 12 years, who lived in rural and urban areas. Overall, children in rural and urban areas met the Malaysian RNI of iron, vitamin A, vitamin C, and protein. Less than 10% of children did not meet the RNI for these nutrients [3]. Despite this reassuring population-level data, individual cases of scurvy can still occur due to extreme selective eating habits, as illustrated by our patient.

Vitamin C, or ascorbic acid, is a water-soluble micronutrient essential for human health. It is required for collagen biosynthesis, contributing to the structural integrity of skin, vasculature, bone, and connective tissue. Vitamin C also serves as a strong antioxidant and plays a role in immune regulation. It also facilitates iron absorption in the small intestine. Vitamin C deficiency causes impairment of osteoid bone maturation, abnormal osteoblast and osteoclast function, and bleeding tendency, leading to bruising, hematoma, hemarthrosis, and subperiosteal bleeding.

Diagnosing scurvy in paediatric patients remains challenging, considering its rarity and non-specific symptoms, which often lead to extensive

investigation and delayed diagnosis. Early symptoms of scurvy are fatigue, irritability, and poor appetite, which are later followed by musculoskeletal and mucocutaneous manifestations that mimic trauma, infections, and rheumatological and haematological diseases [4]. Common initial misdiagnoses include leukaemia, vasculitis, septic arthritis, or child abuse.

A systematic review by Trapani et al. (2022) found that musculoskeletal symptoms were present in 90% of paediatric scurvy cases, including arthritis and lower limb pain, while 33% exhibited a limp or refusal to walk [5]. Mucocutaneous involvement is also typical in paediatric scurvy. In a case series from Thailand, 96% of children with scurvy were unable to walk. In this cohort, 96% also had limb pain, 43% had gingival bleeding, 46% had lower extremity joint swelling, 36% had gum hypertrophy, and 3.6% had petechial haemorrhage [6].

Review of the other three paediatric scurvy cases reported in Table 1 shows a similar musculoskeletal presentation to our case, with all presenting with joint pain and inability to walk. However, unlike those three cases, our patient had no gum hypertrophy or bleeding tendency, highlighting that mucocutaneous findings are not always present. Vitamin C level is the gold standard for the diagnosis of scurvy. However, it is unavailable in most government hospitals in Malaysia as it is rarely done and costly.

Radiological findings are often pathognomonic and crucial for diagnosis when clinical history is unclear. Typical findings are seen at the distal ends of the long bones, most notably the knee and ankle joints. In scurvy, these characteristic skeletal changes result from disruption of endochondral ossification due to impaired osteoid production by osteoblasts. Ongoing osteoclastic activity in the absence of sufficient new bone formation leads to an osteoporotic appearance, characterized by generalised osteopenia and cortical thinning [7].

Paediatric scurvy is typically associated with characteristic radiographic findings. These hallmark signs are Fränkel's line, an irregular but

thickened white line in the metaphyseal endings, representing the zone of well-calcified cartilage and an adjacent Trummerfeld zone, a rarefaction secondary to poorly formed trabeculae. In addition, the Pelkan spur represents a healing metaphyseal pathological fracture, and the Wimberger ring sign denotes a thin sclerotic rim surrounding a small lucent epiphysis [8][9]. Notably, none of these classic radiographic features were present in our case, illustrating that normal X-rays do not exclude scurvy. MRI may demonstrate non-specific focal abnormalities in the bone marrow, characterized by T2-weighted hyperintensity in the metaphyseal regions, along with prominent periosteal reaction and marked adjacent soft tissue oedema [10].

Fresh fruits and vegetables are the main source of vitamin C, especially citrus fruits, berries, leafy greens, peppers, tomatoes, and potatoes. Likewise, breast milk supplies infants with adequate vitamin C to meet nutritional requirements [11]. The daily requirement of vitamin C in children varies with age, ranging from 25 mg/day to 40 mg/day for children between 0 and 6 months and up to 18 years old [12]. Scurvy typically manifests when serum vitamin C levels fall below 0.2 mg/dL, and the total body stores drop below 300 mg [4]. Since the body lacks a long-term storage mechanism for vitamin C, deficiency can develop in 1 to 3 months of inadequate intake [13]. Symptoms often improve dramatically within 24 – 72 hours of initiating oral vitamin C supplementation, which is both diagnostic and therapeutic. Spontaneous bleeding, oral and constitutional symptoms usually resolve within days, followed by gradual improvement of bone abnormalities and ecchymoses over weeks, with full resolution of other clinical and haematologic findings by 3 months [14].

The three previously reported scurvy cases (Table 1) demonstrate that gum hypertrophy and spontaneous bleeding resolved within 1 week, and musculoskeletal symptoms resolved within 1 to 2 months, consistent with our patient's recovery. Although there is an apparent increasing trend of paediatric scurvy cases in Malaysia, routine

screening of scurvy in school-going children in Malaysia is unnecessary, as the incidence is rare. Furthermore, the SEANUT I report and study by Friesland Campina Institute in 2022 found that most children in Malaysia meet the RNI for vitamin C [3]. However, a high index of suspicion is warranted among high-risk group children presenting with musculoskeletal and mucocutaneous symptoms.

Increased awareness among clinicians regarding the reemergence of scurvy is critical, especially in high-risk populations presenting with musculoskeletal and mucocutaneous symptoms, for early diagnosis and treatment. Education of caregivers regarding balanced nutrition and appropriate dietary supplementation plays a key role in the prevention of scurvy.

The reemergence of scurvy in the modern era is linked to dietary insufficiencies, socioeconomic factors, and underlying health or developmental issues. In this case, scurvy developed in a developmentally normal and well-off child due to a highly selective eating habit, which meant that scurvy was not among the initial diagnoses; consequently, the patient was subjected to extensive investigations and experienced delayed diagnosis. This case highlights the importance of obtaining a thorough dietary history and considering scurvy in the differential diagnosis of children presenting with unexplained limp or lower extremity weakness, despite its rarity.

Conclusion

Paediatric scurvy, though uncommon, should not be overlooked, especially in children with selective eating habits. A high index of suspicion and a detailed dietary history are crucial for timely diagnosis and effective treatment. Despite its rarity, scurvy remains clinically relevant and is easily treatable once recognized. Early diagnosis not only ensures prompt recovery but also avoids unnecessary investigations and potential complications.

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Conflict of interest

All authors declare no conflicts of interest.

Ethics

The patient and both her parents provided consent for the use of images and the publication of this case.

Authors' contributions

FA contributed to the writing, review, and editing of the manuscript. HO contributed to drafting the manuscript, conducting the literature search, and reviewing and editing the manuscript.



Figure 1



Figure 2

Figures 1 and 2: Bilateral knee fixed flexion deformity with prominent quadriceps wasting. The knees are not swollen or erythematous



Figure 3. Improved muscle bulk after 1 month of treatment.



Figure 4. Full knee extension achieved after treatment..

Table 1. Case reports of paediatric scurvy in the modern era

Year	Age/Sex	Country	Presenting Symptoms & Key Features	Underlying Risk Factor(s)	Author
2022	6/F	Malaysia	Leg pain, inability to walk, and gingival hypertrophy with contact bleeding. Gingival biopsy: Gingivitis. Treatment: Vitamin C 100 mg 3x per day for 1 week and 100mg daily for 6 months Outcome: Oral symptoms improved after 4 days, total leg and oral pain resolved after 6 weeks.	Picky eater	Jauhar N et al, MJPCH, 2022 [15]
2022	5/M	Singapore	Bilateral lower limbs pain and inability to ambulate for 2 months, gum hypertrophy with contact bleeding, petechial rash over forearms with perifollicular haemorrhages, and corkscrew hair. Treatment: Vitamin C 400 mg/day Outcome: Musculoskeletal symptoms completely resolved, and the patient was ambulant after 1 month.	Severe Autism Spectrum Disorder	Chan et al Egyptian Paediatric Association Gazette 2024 [16]
2024	13/M	South Africa	Bilateral lower limb purpuric rash, arthritis, severe anaemia (Hb=5.9g/dl), and right-sided intraoral mandibular fungating and protruding mass Intraoral mass biopsy: Extensive haemorrhage with fibrin and organizing hematoma within the subepithelial stroma. Treatment: Vitamin C 100 mg 3x per day Outcome: Purpuric rash and oedema resolved after 1 week. Musculoskeletal symptoms completely resolved, and the patient was ambulant after 2 months.	Global developmental delay and epilepsy secondary to Lennox-Gastaut syndrome	Kassa et al. Paediatric Rheumatology (2024) [17]
2025	7/F	Malaysia (our case)	Bilateral knee and hip pain with inability to walk for 2 months. Treatment: Vitamin C tablets at 100 mg 3x per day for 2 weeks, then 100 mg 2x per day for 1 week, then 100 mg per day for 1 month Outcome: Marked improvement after 2 weeks, and achieved full recovery after 1 month	Picky eater	

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