

CASE REPORT

Chronic leg ulceration caused by an absent inferior vena cava in a 52-year-old man: A case report from Nakuru, Kenya

Peter R. Oduor¹, George Jeremiah², Eugene Egunza², Samuel Wanjara³

¹Department of Surgery, Egerton University, Njoro, Kenya

²Faculty of Health Sciences, Egerton University, Njoro, Kenya

³Nakuru Level 5 Hospital, Nakuru, Kenya

Correspondence: Dr Samuel Wanjara (gla.sawa@gmail.com)

© 2021 P.R. Oduor et al.

This open access article is licensed under a Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.



East Cent Afr J Surg. 2022;27(1):38-41
<https://doi.org/10.4314/ecajs.v27i1.7>

Abstract

Chronic leg ulcers adversely affect quality of life and are associated with a substantial economic burden. The congenital absence of the inferior vena cava (IVC) is a rare cause of these ulcers. This case report details a 52-year-old male patient from Kenya who had bilateral chronic leg ulcers. Despite undergoing venous stripping and contralateral ligation of perforators, his condition did not significantly improve. Further investigation revealed the absence of an IVC. His management included the use of compression devices, wound care, and wound coverage with skin grafting. Following this treatment, his ulcers healed satisfactorily, and he continues to use compression devices.

The absence of risk factors for common causes, bilateral presentation of the ulcer, and the presence of prominent veins on the anterior abdominal wall should prompt clinicians to consider an absent IVC. An appropriate management strategy for ulcers resulting from an absent IVC consists of wound care, the use of compression devices, and wound coverage.

Keywords: chronic leg ulcers, inferior vena cava agenesis, venous ulcers, wound management, compression devices, Kenya

Introduction

Chronic leg ulcers (CLUs) are full-thickness skin defects of the leg that either show no tendency to heal after 3 months of appropriate treatment or that are not fully healed at 12 months.^{[1],[2]}

In high-income countries, venous insufficiency is the most common cause of CLUs.^[3] For example, the CLU prevalence among patients with venous insufficiency is 47.6% in Germany, 72% in the UK, and 81% in Ireland.^{[4]-[6]} Meanwhile, it is believed that the incidence of CLUs in Africa is increasing because of a westernization of lifestyles.^[7]

Unilateral leg ulcers are more prevalent than bilateral ulcers, with rates of 93.3% and 6.7%, respectively. These ulcers significantly affect overall health, psychosocial well-being, and quality of life. Additionally, they impose a substantial economic burden on both patients and healthcare systems.^{[8],[9]}

Disease entities associated with CLUs include peripheral venous and arterial diseases, diabetes mellitus, sickle cell disease, infections, neuropathies, and skin cancer.^{[7],[10]}

While the majority of CLUs result from peripheral venous insufficiency,^[1] a congenitally absent inferior vena cava (IVC) is a rare cause. Indeed, only a few cases have been reported in the literature, with none originating from Africa.^{[11],[12]}

We present a case of a man with bilateral CLUs and an absent IVC, whose condition did not significantly improve following venous stripping and ligation of perforators.

Case presentation

We present a case of a 52-year-old man from Nakuru, Kenya, who reported a 15-year history of bilateral leg ulcers.

The ulcers initially appeared on the left leg following minor trauma, with the initial break in the skin progressively enlarging despite numerous nonsurgical treatments. Subsequently, he developed hyperpigmentation of the surrounding skin, itchiness, and leg oedema. A similar lesion appeared on the right leg 3 months later, in a similar area to the corresponding site on the left, and it increased in size following the same unremitting pattern.



Figure 1. Bilateral circumferential ulcers in the distal third of each leg of a 52-year-old man managed at a level 5 hospital in Nakuru, Kenya



Figure 2. Prominent tortuous veins on the anterior abdominal wall of a 52-year-old man managed at a level 5 hospital in Nakuru, Kenya

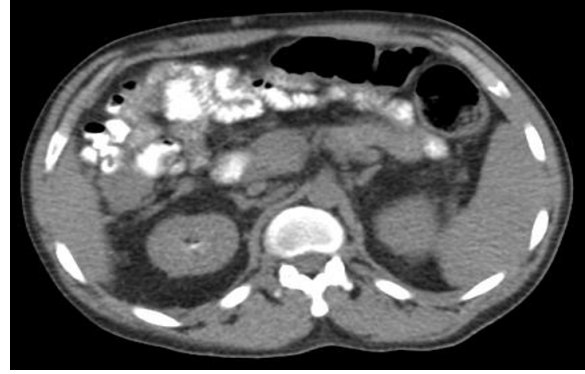


Figure 3. Axial abdominal computed tomography image of a 52-year-old man with no visible inferior vena cava, managed at a level 5 hospital in Nakuru, Kenya



Figure 4. Bilateral chronic leg ulcers of a 52-year-old man after split-thickness skin grafting performed at a level 5 hospital in Nakuru, Kenya

The patient had no history or symptoms indicative of cardiorespiratory disease and no history suggesting a significant risk for chronic venous insufficiency. He had no comorbid conditions and no history of tobacco or alcohol consumption.

The ulcers, which were circumferential and on the distal third of each leg, measured 15 cm in length (Figure 1).

The area surrounding the wound exhibited lipodermatosclerotic changes. The wound margins were regular with sloping edges, and their floors exhibited poor granulation. He also had bilateral, discrete, nontender inguinal lymphadenopathy.

Upon examination of his abdomen, prominent tortuous veins were observed on the anterior abdominal wall, draining upwards (Figure 2).

All parameters in his complete blood count and renal function tests were within the normal ranges.

Abdominal computed tomography (CT) revealed an absent IVC and multiple collateral circulatory pathways (Figure 3).



Figure 5. Triple-layer compression stockings prescribed as part of the management for a 52-year-old man patient managed at a level 5 hospital in Nakuru, Kenya

Management

He initially underwent venous stripping of the left great saphenous vein and ligation of the right leg's perforator veins, but these procedures did not significantly improve his ulcers.

He subsequently underwent wound care with triple-layer compression bandaging, which markedly improved the quality of the granulation tissue. Four months after the initiation of the triple-layer dressings, the ulcers were treated with split-thickness skin grafts, with the triple-layer compression bandaging continuing. After graft take was observed, he was advised to switch to class III compression hosiery. The wounds have since healed satisfactorily, and he has continued the use of compression stockings (Figure 4, Figure 5).

Discussion

This case highlights that an absent IVC can be a cause of leg ulcers. With an absent IVC, venous return occurs via a deep collateral system, the epigastric veins, and the azygos system.^[13] This return is usually inadequate, resulting in chronic venous hypertension and a predisposition to thrombosis.^[12] Consequently, this leads to the development of venous ulcers in the lower extremities.

In retrospect, the surgical procedures undertaken were unnecessary and unlikely to contribute to the healing of the

patient's ulcers. Mokoena^[14] emphasizes that a clinician should carefully examine a patient's torso before venous stripping. Indeed, the absence of historical factors indicating a potential cause, the bilaterality of the ulcer, and prominent veins on the anterior abdominal wall should alert the clinician to a possible caval obstruction or absence, prompting further imaging. This could lead to an early definitive diagnosis and the avoidance of unnecessary surgical procedures.

The incidence of absent IVC is estimated to range from 0.0005% to 1% in the general population.^[15] When IVC absence is suspected, the appropriate noninvasive diagnostic tools for diagnosis are CT or magnetic resonance imaging.^[16] In such cases, CT, magnetic resonance imaging, and Doppler ultrasonography can be useful for investigating potential proximal deep venous thrombosis (DVT).^[17] Management should include leg compression to enhance venous return, prophylaxis against DVT, and wound care. Surgery to provide wound coverage should be considered when the ulcer is deemed ready for it. Operations to correct the IVC anomaly may not be necessary, but Dougherty et al.^[11] facilitated symptom resolution by performing venous bypass for a patient with a congenitally absent IVC, leg venous stasis, and ulceration.

Amano et al.^[12] managed a similar case: a 55-year-old man who underwent venous stripping but experienced no resolution of bilateral lower limb varicosities. He was successfully managed conservatively with compression stockings and topical 1% silver sulfadiazine. Likewise, the sequelae of lower limb venous hypertension can manifest in younger patients, and management should prioritize compression devices to reduce stasis.^[18] Sitwala et al.^[19] additionally propose lifelong anticoagulation to cover the risk of thrombosis.

While compression stockings remain the mainstay of chronic venous disease management, venoactive drugs and anticoagulants are key components of contemporary medical management. Newer surgical treatments include open or percutaneous balloon angioplasty, superficial vein ablation, and deep vein interrogation (for occlusion or proximal DVT) with intravascular ultrasound, with or without stenting.^{[20],[21]} The treatment of DVT includes anticoagulants, catheter-directed thrombolysis, and thrombectomy.^[15] Open surgical repair is considered when venous blockage is not amenable to treatment with endovascular techniques or in cases of venous hypoplasia. These repairs can involve a femorofemoral bypass, femoroiliac-infrahepatic IVC bypass, common femoral vein patch plasty, or valvuloplasties.^[21]

Conclusions

An absent IVC is a rare cause of CLUs. The absence of historical risk factors for common causes of CLUs, the bilateral nature of the ulcers, and the presence of prominent veins on the anterior abdominal wall should alert clinicians to a possible absent IVC. Wound care, the use of compression devices, and wound coverage comprise an adequate management strategy for ulcers resulting from an absent IVC.

References

- Kahle B, Hermanns HJ, Gallenkemper G. Evidence-based treatment of chronic leg ulcers. *Dtsch Arztebl Int*. 2011;108(14):231-237. doi:10.3238/arztebl.2011.0231 [\[View Article\]](#) [\[PubMed\]](#)
- Agale SV. Chronic leg ulcers: epidemiology, aetiopathogenesis, and management. *Ulcers*. 2013;2013:413604. doi:10.1155/2013/413604 [\[View Article\]](#)
- Briggs M, Flemming K. Living with leg ulceration: a synthesis of qualitative research. *J Adv Nurs*. 2007;59(4):319-328. doi:10.1111/j.1365-2648.2007.04348.x [\[View Article\]](#) [\[PubMed\]](#)
- Adam DJ, Naik J, Hartshorne T, Bello M, London NJ. The diagnosis and management of 689 chronic leg ulcers in a single-visit assessment clinic. *Eur J Vasc Endovasc Surg*. 2003;25(5):462-468. doi:10.1053/ejvs.2002.1906 [\[View Article\]](#) [\[PubMed\]](#)
- Körber A, Klode J, Al-Benna S, et al. Etiology of chronic leg ulcers in 31,619 patients in Germany analyzed by an expert survey. *J Dtsch Dermatol Ges*. 2011;9(2):116-121. doi:10.1111/j.1610-0387.2010.07535.x [\[View Article\]](#) [\[PubMed\]](#)
- O'Brien JF, Grace PA, Perry IJ, Burke PE. Prevalence and aetiology of leg ulcers in Ireland. *Ir J Med Sci*. 2000;169(2):110-112. doi:10.1007/BF03166911 [\[View Article\]](#) [\[PubMed\]](#)
- Danwang C, Tochie JN, Mazou TN, Nzalio RNT, Bigna JJ. Contemporary occurrence and aetiology of chronic leg ulcers in Africa: a systematic review and meta-analysis protocol. *BMJ Open*. 2019;9(5):e026868. doi:10.1136/bmjopen-2018-026868 [\[View Article\]](#) [\[PubMed\]](#)
- Rahman GA, Adigun IA, Fadeyi A. Epidemiology, etiology, and treatment of chronic leg ulcer: experience with sixty patients. *Ann Afr Med*. 2010;9(1):1-4. doi:10.4103/1596-3519.62615 [\[View Article\]](#) [\[PubMed\]](#)
- Green J, Jester R, McKinley R, Pooler A. The impact of chronic venous leg ulcers: a systematic review. *J Wound Care*. 2014;23(12):601-612. doi:10.12968/jowc.2014.23.12.601 [\[View Article\]](#) [\[PubMed\]](#)
- Frykberg RG, Banks J. Challenges in the treatment of chronic wounds. *Adv Wound Care (New Rochelle)*. 2015;4(9):560-582. doi:10.1089/wound.2015.0635 [\[View Article\]](#) [\[PubMed\]](#)
- Dougherty MJ, Calligaro KD, DeLaurentis DA. Congenitally absent inferior vena cava presenting in adulthood with venous stasis and ulceration: a surgically treated case. *J Vasc Surg*. 1996;23(1):141-146. doi:10.1016/s0741-5214(05)80044-8 [\[View Article\]](#) [\[PubMed\]](#)
- Amano H, Nagai Y, Endo Y, Iwasaki T, Ishikawa O. Leg ulceration in chronic venous insufficiency caused by an absent inferior vena cava. *Acta Derm Venereol*. 2009;89(5):502-504. doi:10.2340/00015555-0692 [\[View Article\]](#) [\[PubMed\]](#)
- Simon RW, Amann-Vesti BR, Pfammatter T, Koppensteiner R. Congenital absence of the inferior vena cava: a rare risk factor for idiopathic deep-vein thrombosis. *J Vasc Surg*. 2006;44(2):416. doi:10.1016/j.jvs.2005.05.004 [\[View Article\]](#) [\[PubMed\]](#)
- Mokoena T. Varicose veins: look before you strip - the occluded inferior vena cava and other lurking pathologies. *S Afr Med J*. 2014;104(10):668-670. doi:10.7196/samj.8395 [\[View Article\]](#) [\[PubMed\]](#)
- Singh K, Poliquin J, Syversten G, Kohler DO. A rare cause of venous thrombosis: Congenital absence (agenesis) of the inferior vena cava. *Int J Angiol*. 2010;19(3):e110-e112. doi:10.1055/s-0031-1278377 [\[View Article\]](#) [\[PubMed\]](#)
- Gayer G, Zissin R, Strauss S, Hertz M. IVC anomalies and right renal aplasia detected on CT: a possible link? *Abdom Imaging*. 2003;28(3):395-399. doi:10.1007/s00261-002-0090-7 [\[View Article\]](#) [\[PubMed\]](#)
- Karande GY, Hedgire SS, Sanchez Y, et al. Advanced imaging in acute and chronic deep vein thrombosis. *Cardiovasc Diagn Ther*. 2016;6(6):493-507. doi:10.21037/cdt.2016.12.06 [\[View Article\]](#) [\[PubMed\]](#)
- Phair J, Trestman E, Stableford J. Venous status ulcers due to congenital agenesis of the inferior vena cava in a 16-year-old male. *Vascular*. 2016;24(1):106-108. doi:10.1177/1708538115587453 [\[View Article\]](#) [\[PubMed\]](#)
- Sitwala PS, Ladia VM, Brahmabhatt PB, Jain V, Bajaj K. Inferior vena cava anomaly: a risk for deep vein thrombosis. *N Am J Med Sci*. 2014;6(11):601-603. doi:10.4103/1947-2714.145486 [\[View Article\]](#) [\[PubMed\]](#)
- Aherne TM, Keohane C, Mullins M, et al. DEep VEin Lesion OPTimisation (DEVELOP) trial: protocol for a randomised, assessor-blinded feasibility trial of iliac vein intervention for venous leg ulcers. *Pilot Feasibility Stud*. 2021;7(1):42. doi:10.1186/s40814-021-00779-2 [\[View Article\]](#) [\[PubMed\]](#)
- Saha P, Black S, Breen K, Patel A, Modarai B, Smith A. Contemporary management of acute and chronic deep venous thrombosis. *Br Med Bull*. 2016;117(1):107-120. doi:10.1093/bmb/ldw006 [\[View Article\]](#) [\[PubMed\]](#)

Peer reviewed

Competing interests: None declared

Received: 24 May 2021 • **Revised:** 13 Sep 2021

Accepted: 23 Sep 2021 • **Published:** 22 Nov 2021

Cite this article as: Oduor PR, Jeremiah G, Egunza E, Wanjara. Chronic leg ulceration caused by an absent inferior vena cava in a 52-year-old man: a case report from Nakuru, Kenya. *East Cent Afr J Surg*. 2022;27(1):38-41. doi:10.4314/ecajs.v27i1.7

© P.R. Oduor et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are properly cited. To view a copy of the license, visit <http://creativecommons.org/licenses/by/4.0/>.