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Beyond the Sting: Herbal Remedy–Induced Corrosive Esophageal Strictures from Nigeria – A Case Series

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Abstract

Background: Scorpion stings are common in rural Sub-Saharan Africa and often managed with traditional herbal remedies. Some of these preparations contain caustic substances that can cause corrosive esophageal strictures (CES). While caustic soda ingestion is a well-recognized cause of CES in children, herbal remedy–induced strictures following scorpion stings remain underreported.

Methods: This retrospective case series reviewed all patients presenting with CES after ingestion of herbal preparations administered for scorpion stings at a tertiary hospital in South-East Nigeria between January 2024 and November 2025. Demographic data, time to presentation, severity of dysphagia (Mellow & Pinkas scale), interventions, and outcomes were documented.

Results: Five patients (3 males, 2 females) aged 5–45 years were identified. The median delay to presentation was 3 months (range: 6 weeks–8 months). Severe dysphagia was the predominant symptom, with 40% presenting with Grade 4 dysphagia. All patients had long-segment strictures confirmed by barium swallows. Three patients (60%) underwent surgery: two adolescents had a successful retrosternal colon bypass, while one child died in the immediate postoperative period following gastric pull-up. Two patients (40%) defaulted from treatment for socioeconomic reasons.

Conclusion: Herbal remedies for scorpion stings represent an emerging and preventable cause of CES in Nigeria. Public education, regulatory oversight of caustic herbal preparations, and timely referral for nutritional rehabilitation and surgical intervention are critical to improving outcomes.

Keywords: Scorpion sting, Herbal remedies, Corrosive esophageal stricture

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Background

Scorpion stings are a common occurrence in rural Sub-Saharan Africa, particularly among farming and palm-harvesting communities.¹ While infrequently fatal, the intense pain and anxiety they cause often drive victims to seek immediate relief through traditional remedies. One such remedy is the ingestion of herbal concoctions, many of which contain caustic substances capable of causing severe gastrointestinal injury.^{2,3}

Corrosive esophageal strictures have been widely reported in children, often resulting from accidental ingestion of household cleaning agents or caustic soda used in local soap production.⁴ In adults, most cases arise from parasuicidal or homicidal attempts, with accidental ingestion being relatively rare.⁵ However, corrosive esophageal injury from the intentional ingestion of herbal remedies for scorpion stings remains underreported, especially among adults.^{6,7} Although various plant-based therapies have been documented—particularly phytochemicals believed to neutralize venom components or reduce inflammation—their clinical use remains largely informal, unstandardized, and unregulated.⁸ Management of scorpion envenomation is primarily supportive and symptom-based, while antivenom is typically reserved for severe or life-threatening cases.⁹

This case series describes five patients who developed corrosive esophageal strictures (CES) over a 22-month period (January 2024 to November 2025). These cases followed the ingestion of traditional herbal preparations intended to neutralize scorpion venom. The clinical presentations, interventions, and outcomes observed underscore the urgent need for public education, early recognition, and timely surgical referral.

While caustic soda ingestion is well known, herbal concoction-induced corrosive injury remains underreported. Herbal therapies are widely used in scorpion envenomation in rural communities, but their corrosive potential remains undocumented. This case series highlights severe esophageal injuries arising from such practices, prompting a need for clinical vigilance and public health action.

Method

This was a 22-month retrospective study of all patients presenting with corrosive esophageal stricture between January 2024 and November 2025 at Alex Ekwueme Federal University Teaching Hospital, Abakaliki, a tertiary teaching hospital in South-East Nigeria, following ingestion of caustic herbal substances. Patients were included if they (1) had documented ingestion of a corrosive herbal preparation following a scorpion sting and (2) had radiologic and/or endoscopic confirmation of esophageal stricture.

The data extracted included the age, sex, time to presentation, dysphagia severity (graded using the Mellow & Pinkas scale), type of intervention, and treatment outcome. The diagnosis of corrosive esophageal stricture was confirmed by barium swallow.

All consecutive patients who met the inclusion criteria within the study period were included, thereby reducing the risk of selection bias. No other potential sources of bias were identified.

Informed consent for the use of anonymized clinical data and images was obtained from patients or their guardians.



Figure 1: Preoperative barium swallow showing long-segment mid-esophageal stricture showing a dilated cervical esophagus with abrupt distal cut-off and no extravasation, consistent with a tight long-segment stricture and complete obstruction to distal contrast passage.

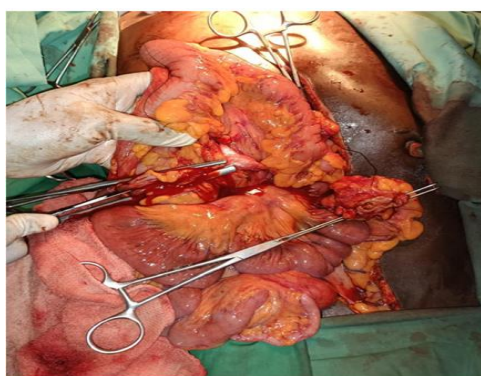


Figure 2: Intraoperative left colon harvest.



Figure 3: Postoperative barium swallow, showing a well-opacified colon conduit in the expected retrosternal position. The cervical anastomosis is intact with no contrast leak, and contrast flows smoothly through the interposed colon without hold-up or obstruction, consistent with a patent and well-functioning graft.

Results

Five patients (3 males, 2 females), aged 5–45 years, presented with CES following ingestion of herbal concoctions administered after scorpion stings. Median time to presentation was 3 months (range: 6 weeks–8 months); 80% presented more than 6 weeks after ingestion (Table 1).

Severe dysphagia was the predominant presentation—40% (2 of 5) had Grade 4 and 60% (3 of 5) had Grade 3 dysphagia, according to the Mellow & Pinkas scale. All patients had long-segment strictures confirmed by barium swallow.

Three patients (60%) underwent surgical intervention. Two adolescents (40%) had a successful retrosternal left colon bypass. One five-year-old child (20%) underwent gastric pull-up but died in the immediate postoperative period. Two patients (40%) did not undergo definitive surgery — one was discharged against medical advice and one defaulted due to financial constraints (Table 1).

Overall, the outcomes varied: two recoveries, one perioperative death, and two treatment defaults, reflecting the complex interplay of clinical, economic, and systemic factors influencing management outcomes in this setting.

Table 1. Summary of Scorpion Sting Herbal Remedy–Induced Corrosive Long-segment Esophageal Strictures (n=5)

Case No	Age	Sex	Delay to Presentation	Dysphagia Grade*	Intervention	Outcome
1	18 years	M	3 months	4	Left Colon Bypass	Successful
2	16 years	F	8 months	4	Left Colon Bypass	Successful
3	15 years	M	3 months	3	None	Discharged against medical advice
4	5 years	F	8 weeks	3	Gastric pull-up	Perioperative death
5	45 years	M	6 weeks	3	None	Defaulted (financial)

*Dysphagia graded according to the Mellow & Pinkas scale

Discussion

The pattern observed in this series reflects the severe clinical burden associated with ingestion of caustic herbal preparations after scorpion stings. Patients typically arrived late, often after prolonged dysphagia and significant nutritional decline, and many had extensive strictures requiring major reconstructive surgery.³ The poor postoperative outcome seen in a child with advanced malnutrition, as well as the inability of some patients to access definitive treatment due to financial constraints, illustrates how delayed presentation, nutritional compromise, and socioeconomic barriers interact to worsen prognosis in resource-limited settings.

Scorpion stings remain prevalent in rural Nigeria, particularly during the rainy and farming seasons.¹⁰ While fatalities are uncommon, the associated pain and fear often lead to the use of traditional remedies. A widely held belief is that ingestion of certain herbal mixtures can neutralize scorpion venom. Unfortunately, unregulated concoctions that may remedy various conditions can contain caustic agents that can injure the esophageal mucosa.³

Corrosive esophageal strictures remain a significant health concern, particularly in children from developing regions. Historically,

these injuries were most commonly caused by accidental ingestion of caustic soda—an agent widely used in local soap-making and often stored in drink containers.^{11, 12} In recent times, however, herbal concoctions used as traditional treatments for scorpion stings have emerged as a notable cause.¹³ These unregulated preparations may contain ingredients such as potassium permanganate, lye, or caustic soda, leading to liquefactive necrosis of the esophageal lining.³ Resultant strictures significantly impair swallowing, nutritional intake, and overall quality of life. The pathophysiology of these injuries closely mirrors that seen in caustic soda ingestion.^{3,5} It begins with acute mucosal injury, progressing through stages of ulceration, granulation, fibrosis, and ultimately stricture formation. These strictures impair swallowing and frequently lead to complications such as dehydration, electrolyte imbalance, and malnutrition. The severity of tissue damage is influenced by several factors, including the pH, concentration, and physical form of the corrosive agent, as well as the volume ingested, contact duration, and the premorbid condition of the esophageal mucosa.⁶

Substances with extreme pH levels (<2 for acids or >12 for alkalis) can rapidly penetrate the esophageal lining. [14] Acids typically induce

coagulative necrosis and eschar formation, which may limit deeper tissue penetration. However, gastric outlet (pyloric) injury is not uncommon, giving rise to the aphorism: *"Acid licks the esophagus but bites the pylorus."*

In contrast, alkaline agents—often more viscous—tend to adhere to the esophageal mucosa for longer periods, causing liquefactive necrosis and deeper, more extensive tissue destruction.^{15,16}

The esophageal lining is generally more resistant to acid than to alkali, making alkaline ingestion particularly dangerous due to its tendency to penetrate beyond the submucosa and involve the muscularis propria. This deeper injury increases the likelihood of transmural damage and stricture formation, aptly summarized by the clinical adage: *"Acid licks the esophagus, alkali chews it."*

Two adolescents (Cases 1 and 2) underwent a successful retrosternal left colon bypass (Figures 1-3). In contrast, a 5-year-old (Case 4) died perioperatively during a gastric pull-up procedure due to postoperative complications – an outcome that emphasizes the vulnerability of malnourished pediatric patients and the limitations of perioperative care in resource-constrained environments.

In our series, outcomes varied—two patients had a successful surgical bypass, another died during a gastric pull-up procedure, while two others defaulted due to socioeconomic constraints. This reflects the multifactorial challenges—clinical, cultural, and financial—encountered in the management of corrosive injuries.

Although the primary focus of this report is on herbal-induced corrosive esophageal injuries, it is essential to acknowledge the continued burden of caustic soda ingestion in Nigeria. Several studies have consistently identified caustic soda as the leading cause of CES, especially among children due to accidental ingestion of soap-making chemicals stored in drink bottles or left unattended in homes. Ekpe and Ette reported significant morbidity and mortality from caustic ingestion in rural

Nigerian children, highlighting delayed presentation and poor access to surgical care as persistent challenges.⁴

Similarly, Adedeji et al. described these injuries as a "preventable menace", emphasizing the role of community education and safe storage practices in reducing incidence.⁵ This underscores the need for continued advocacy for safer household chemical practices, particularly in rural settings where both traditional and caustic-related injuries coexist. Despite the long-standing predominance of caustic soda ingestion as the leading cause of corrosive esophageal strictures in Nigeria, ingestion of caustic herbal concoctions—particularly as traditional remedies for scorpion stings—has emerged as a concerning new trend.

While endoscopic dilatation is effective in some pediatric cases of corrosive esophageal stricture, surgical options such as colon interposition or gastric pull-up remain the mainstay for long-segment or non-dilatable strictures.^{15,17}

Nutritional rehabilitation via gastrostomy or jejunostomy is often required before definitive repair. Parenteral nutrition, although ideal in severe malnutrition, is rarely feasible in our setting due to high costs, inconsistent availability of Total Parenteral Nutrition (TPN) components, limited capacity for safe central line care, and the profound malnutrition that often accompanies delayed presentation of long-segment esophageal strictures.

Definitive treatment depends on the extent of esophageal damage and the feasibility of endoscopic intervention. While short, pliable strictures may respond to serial dilatation, long-segment or complex strictures—as seen in most of our patients—typically require esophageal replacement using colon interposition or gastric pull-up.¹⁸

These cases underscore the urgent need for public health action. The ingestion of caustic herbal 'antidotes' for scorpion stings—commonly used in rural West Africa—has led to severe, preventable esophageal injuries

across all age groups. This reflects deep gaps in community awareness, poor access to formal healthcare, and the persistence of unregulated traditional practices.

Public education remains critical. Many communities are unaware of the harmful effects of these remedies, necessitating culturally sensitive outreach on safe scorpion sting first aid. Radio campaigns, school health talks, and engagement with local leaders can correct misconceptions and promote safer responses.

Regulatory oversight is equally important. Measures should include tighter control over the distribution of caustic substances, mandatory labeling, and integration of traditional healers into formal health education.

Similar recommendations have been made in pediatric studies on caustic soda ingestion, advocating for safe storage, hazard regulation, and public sensitization. These strategies are equally relevant here.¹⁹

One of the major challenges remains delayed recognition of injury, poor referral systems, and limited financial support—often worsened by inadequate health insurance coverage. These factors contribute to late presentation, malnutrition, and high perioperative risk. Strengthening early diagnosis, ensuring timely referral, and expanding financial protection through accessible health insurance are crucial to reduce disability and improve outcomes in affected patients.

To curb this growing trend, a multidisciplinary and community-based approach is essential—linking healthcare providers, policymakers, and traditional health actors to reduce the burden of corrosive esophageal strictures.¹⁹

Conclusion

This case series identifies an emerging cause of corrosive esophageal stricture in West Africa—ingestion of herbal concoctions administered as traditional remedies for scorpion stings. Tackling this preventable problem demands a

multifaceted response. Community education, cultural engagement, and regulation of caustic herbal preparations are critical to prevention. Early nutritional rehabilitation and prompt referral to specialized surgical centers can improve survival and functional outcomes. Non-governmental organizations can support this effort through public awareness campaigns, advocacy, and financial assistance for vulnerable patients, particularly in rural communities with limited access to formal healthcare. Ultimately, prevention requires more than surgical capacity; it calls for culturally sensitive public health strategies, intersectoral collaboration, and systemic reforms that ensure access to safe, evidence-based care. There is need to establish community-based first aid education programs focusing on safe scorpion sting management and early hospital referral and also advocate for regulatory oversight of traditional healers and herbal preparations, including mandatory labelling, quality control, and restrictions on the sale of caustic substances. Policies on herbal remedy composition, ensuring prohibition of corrosive agents in medicinal preparations, should be enforced, while strengthening referral networks and surgical capacity to improve timely diagnosis, nutritional rehabilitation, and access to definitive surgical intervention. There should be engagement with NGOs and government agencies to provide financial support for low-income patients and fund public health campaigns.

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