

Post-Burn Popliteal Fossa Flexion Contracture: Our Experience with a Case in N'Djamena (Chad)

Daniel Mossalbaye Adendjingue

Orthopedic surgeon: CHU La Référence National, N'Djamena, Tchad
CHU Bon Samaritain : N'Djamena, Tchad

Valentin Andjeffa

Orthopedic surgeon : CHU La Référence National, N'Djamena, Tchad

Madengar Moussede

General surgeon: CHU Bon Samaritain: N'Djamena, Tchad

Abdouramane Ouangre

Orthopedic surgeon: Université Lédéa Bernard OUEDRAOGO
Service d'orthopédie-traumatologie et chirurgie réparatrice du CHUR de
Ouahigouya, Burkina Faso

Magloire Dingamnodje

Orthopedic surgeon: Centre Hospitalier Universitaire la Renaissance,
N'Djamena, Tchad

Emery Nodjiath N.

Orthopedic surgeon: Hôpital Militaire d'Instruction, N'Djamena, Tchad

[Doi:10.19044/esj.2025.v21n33p51](https://doi.org/10.19044/esj.2025.v21n33p51)

Submitted: 09 August 2025

Accepted: 15 November 2025

Published: 30 November 2025

Copyright 2025 Author(s)

Under Creative Commons CC-BY 4.0

OPEN ACCESS

Cite As:

Adendjingue, D.M., Andjeffa, V., Moussede, M., Ouangre, A., Dingamnodje, M. & Nodjiath, N.E. (2025). *Post-Burn Popliteal Fossa Flexion Contracture: Our Experience with a Case in N'Djamena (Chad)*. European Scientific Journal, ESJ, 21 (33), 51.

<https://doi.org/10.19044/esj.2025.v21n33p51>

Abstract

Introduction: The functional sequels of burns, including knee contracture, are common in children in southern countries due to very limited access to specialized care structures. The treatment is surgical, accompanied by physiotherapy to improve the functional result. **Case report:** We report the case of an 11-year-old female patient, admitted to the surgery department after three years. She suffered from sequelae of thermal flame burn of the trunk and lower limbs. She was treated in a rural hospital, and the evolution was complicated by a contracture of the left popliteal fossa and incomplete healing

of the wound. The treatment of the wound was done for thirty days, allowing for an optimal local condition. This was until the suppuration completely stopped (after thirty days). Complete healing was not achieved, but the wound was clean, and the C-Reactive Protein was normal. Surgery to release the flange was possible after two months. A plasty to release the flange was carried out eight weeks later by a “chevron” lengthening tenotomy of the hamstring muscles and transversal fascial incisions (to discharge the gastrocnemius muscles). **Conclusion:** Domestic thermal burns are common among children. The articular localization causes more functional consequences. They require early consultation at a specialized center to minimize the consequences.

Keywords: Burn, popliteal fossa, contracture, surgery, Chad

Introduction

Burns cause numerous functional sequels, particularly at the joint and especially when they are poorly treated. Many improvements in their treatment have been made without, however, reducing their consequences in underdeveloped countries (Sankalé, 2010). These sequels are most often found in children (Barani, 2021; Richard-Kadio, 2000; Sankale-Diouf, 1999) with a significant proportion of retractile flange. In our resource-constrained contexts, initial burns or their sequels are often treated by unqualified personnel. Initial treatment in a specialized center would help avoid many of these complications, the treatment of which is complex and the follow-up more demanding.

We report the case of a young patient admitted to the surgery department of the CHU Le “Bon Samaritain” of N’Djamena for a popliteal fossa contracture.

Clinical case

An eleven-year-old patient, pupil, living with her parents, was admitted for the sequels of a thermal flame burn to the left lower limb. The circumstances were a domestic accident that occurred three years earlier. The affected areas were the two lower limbs and the lower part of the trunk (on the left). She would have been initially treated in a rural hospital. The left lower limb evolved toward a popliteal fossa contracture and incomplete healing.

On admission, we noted good general condition and absolute functional impotence. She also presented dyschromic macules ranging from the distal third of the trunk to the distal third of the leg. We found a roughly triangular suppurative wound on three-quarters of the circumference of the left knee (except medially) (**Fig.1&2**). This was approximately three centimeters above the popliteal fossa contracture. Knee stiffness was at approximately 110

degrees of flexion. Ankle mobility, Reactive Protein (CRP), which was possible, distal sensitivity and motor skills were preserved. Radiograph of the left knee did not reveal osteoarticular damage. The biological assessment was normal except that the C- was elevated (21 mg/L).



Figure 1: Condition of wound dressing and lateral knee x-ray on patient admission (surgery department of the University Hospital “Bon Samaritain”)

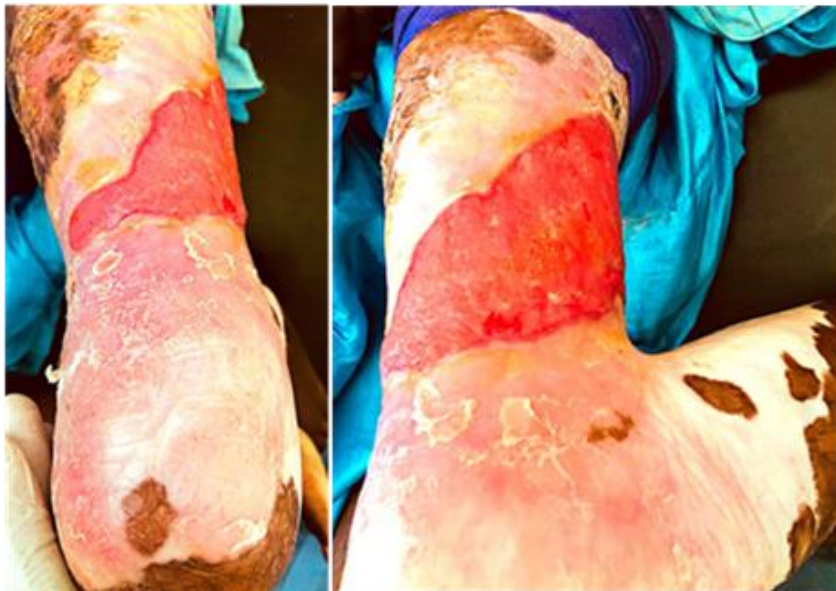


Figure 2: Condition of the wound after four weeks of local care. There is the presence of some fibrin deposits on the wound (surgery department of the University Hospital “Bon Samaritain”)

Prior daily local treatment during ten days was done before continuing every three days. This was until the suppuration was completely stopped (after thirty days). Complete healing was not achieved, but the wound was clean and the CRP was normal (**Fig.3**). Surgery to release the flange was possible after two months.



Figure 3: Patient installation and wound condition which is clean on the day of surgery (surgery department of the University Hospital “Bon Samaritain”)

Installation was in a supine position (general anesthesia), the left hip could be mobilized in all ranges (the tourniquet was not used) (**Fig.3**). We made two posterior transverse incisions: one, approximately three centimeters below the band and the other, above the distal limit of the wound described above. Release was achieved by progressive dissection and hemostasis. Another vertical incision centered on the retractile flange was subsequently necessary to dissect and secure the vascular-nervous elements. A manual knee liberation with release of the gastrocnemius helped to obtain an extension of - 15 degrees (incomplete). This incomplete extension is relative to a brake induced by the hamstring muscles, but also a slight tension in the gastrocnemius. A “chevron” lengthening tenotomy of the hamstring muscles, as well as aponeurotic incisions to release the gastrocnemius muscles, was

made. They help to obtain a complete extension (**Fig.4A&B**). The tendon continuity was restored using overlock stitches (with Vicryl 1). We then carried out an abundant washing with physiological serum followed by a few stitches to protect the vascular-nervous structures. The vertical incision was closed. A fatty dressing was made and a posterior cruropedious plaster in full extension was placed to immobilize the knee (**Fig.4C**).



Figure 4: Intraoperative images showing complete extension of the knee obtained after release (A&B) followed by immobilization with an extension cast splint (C) (surgery department of the University Hospital “Bon Samaritain”)

The evolution was done by partial skin necrosis after three weeks, motivating necrosectomy. Removal of the plaster was possible after six weeks with immediate physiotherapy. Total skin graft was performed eight weeks postoperatively. The total skin was taken from the inguinal region bilaterally and placed preferentially at the popliteal fossa site. The sampling site of the thin skin was the opposite thigh to cover the remaining part. Approximately 90% of the graft was taken and complete healing was achieved after six weeks. The evaluation at 18 months post-operative noted: moderate pain when walking long distances or standing for a long time, walking with a slight steppage, normal active flexion-extension of the knee (**Fig.5A&B&C**).



Figure 5: Images at 18 months post-operative: close-up view of the popliteal fossa (A); anterior and posterior view of pelvic limbs (B&C)

Discussion

Burns, particularly those of thermal origin by flame, are common in developing countries. Children represent the first victims by their proximity to mothers (who are most often in the kitchen) and the inattention of parents (Albertyn, 2006; Kibadi, 2015; Lordier, 1984). The circumstances are often a domestic accident, including gas cylinder explosions or flames which, through inattention, touch the clothes before spreading (as in this case) (Adendjingué, 2023; Boukind, 1994; Damien 2024; Hachicha, 2024). For this case, the initial treatment concerned the wounds alone without thinking about the possible functional handicap. Early mobilization of joints, excision-skin grafting and the wearing of compressive garments⁸ are not often known by many practitioners. In our case, the patient's parents were in financial difficulty and were unable to request treatment in a better-equipped center in the capital. Our countries do not always have a specialized center dedicated to burns, immediately compromising initial care and secondarily promoting the occurrence of sequels. The analgesic position of the flexed knee promotes the occurrence of contracture. Several techniques are described, including Z or trident plasty, transverse incisions in the retraction, or even the rail technique (Abdellaoui, 2022)

Our technique is similar to that of Achbouk (2011), who also made two transverse incisions on either side of the flange, followed by manual release. This technique seems easier and more accessible but for this patient, the loss of skin substance imposed the limit of the proximal and middle incisions of the flange for better exposure. This last gesture could explain the partial skin

necrosis that occurred in this area. Some authors (Sankalé, 2010) realize a one-stage surgery with skin grafting, unlike us. The challenge is the extension of the knee. Like many authors (Adendjinguè, 2023; Sankalé, 2010; Waymack, 1988) immobilization in extension in our case associated with gentle mobilization of the knee help to obtain full extension and to guarantee the avoidance of a residual flexum or unwanted adhesions.

Conclusion

Thermal burns can cause functional after-effects, especially if they affect joints. Their high frequency in children raises parental awareness. Early consultation in a specialized center would minimize the consequences. The treatment of initial lesions must be well codified and early in order to avoid these after-effects. The promotion of specialized treatment centers is more than necessary.

Conflicts of interest: The authors reported no conflicts of interest.

Data availability: All of the data are included in the content of the paper.

Funding statement: The authors did not obtain any funding for this research.

Declaration for Human Participants: This study followed the Ministry of Higher Education and Scientific Research in Chad and its Guideline for Research Ethics Involving Human Subjects in Chad. It complied with the ethical principles of Helsinki for medical research involving human subjects. The research was approved by the medical direction of CHU Le “Bon Samaritain” of N’Djamena. We obtained informed consent from the patient, her parents and authorization from the competent institutional body.

References:

1. Abdellaoui H, Tazi M, Benmassoud Z, Balde FB, Atarraf K, Afifi A. Séquelles Grave De Brûlure Des Deux Pieds : Un Cas Pédiatrique De Déformation Extrême Des Orteils. *Ann Burns Fire Disasters*. 2022 ;35(1):74-78.
2. Achbouk A, Khales A, Bourra K, Tourabi K, Ababou K, Ihrari H. La plastie en rail dans le traitement des brides rétractiles du creux poplite. *Ann Burns Fire Disasters*. 2011 ;24(1) :39.
3. Adendjinguè DM, Andjeffa V, Siniki F, Mouassede M, Nadji G, Toure A. Quelle prise en charge des séquelles de brûlures de membres dans un contexte particulier ? *Ann Burns Fire Disasters*. 2023; 36(4):333-6.
4. Albertyn R, Bickler SW, Rode H. Paediatric burn injuries in Sub Saharan Africa-an overview. *Burns*. 2006 ;32(5) :605-12.

5. Boukind EA, Chafiki N, Bahecar N, Alibou F, Terrab S, Boumzebra Cl., Zerouali OX. Les brûlés : profil épidémiologique et éléments de prévention à propos de 1499 patients hospitalisés à l'unité des brûlés à Casablanca. *Ann Burns Fire Disasters*.1994 ;7: 57-63.
6. Barani C, Brosset S, Personne H , Guillot M , Braye F , Voulliaume D. Comment traiter les séquelles de brûlures palmaires chez l'enfant, à propos de 49 cas. *Ann Chir Plast Esthet*. 2021 ; 66(4):291-7.
7. Goel A, Shrivastava P. Post-burn scars and scar contractures. *Indian J Plast Surg*. 2010;43(Suppl): S63-71.
8. Hachicha S, Mokline A, Ghedira S, Rahmouni M, Fraj H, Ben Saad M, Messadi AA. Brûlures Chez Le Diabétique: Étude Épidémiologique, Clinique et Pronostique [Burns and Diabetes Mellitus: Epidemiology, Clinical Presentation and Prognosis]. *Ann Burns Fire Disasters*. 2024 ;37(1):23-7.
9. Kibadi K, Moutet F. Traitement des séquelles de brûlures de la main dans les pays à ressources limitées ; notre expérience en république démocratique du Congo. *Ann Burns Fire Disasters*. 2015 ;28(1) :32.
10. Lordier A : Epidémiologie des accidents chez l'enfant. *Revue du praticien*. 1984 ;34: 1545-55.
11. Malbos D. Brûlures : étiologies et gravité. *Actualités Pharmaceutiques*. 2024 ; 63(641) : 29-31.
12. Richard-Kadio M, Yeo S, Kossoko H, et al. Séquelles de brûlures. Aspects cliniques et problèmes thérapeutiques en Côte d'Ivoire. *Brûlures*.2000 ; 1(1) :30-6.
13. Sankalé AA, Nyemb PMM, Coulibaly NF, Ndiaye A, Ndoye M. Les cicatrices rétractiles post-brûlures du membre inférieur chez l'enfant. *Annals of Burns and Fire Disasters*.2010 ;23(2) :75.
14. Sankale-Diouf AA, Wandaogo A, Tekou H, Fall I, Ndoye M. Les cicatrices rétractiles de la main brûlée chez l'enfant : Une revue de 79 cas. In *Annales de chirurgie de la main et du membre supérieur*. Elsevier Masson.1999 :18(1) :21-7.
15. Waymack JP, Fidler J, Warden GD. Surgical correction of burn scar contractures of the foot in children. *Burns*. 1988 ; 14(2) :156-60.