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Management of Thermal Burns During Pregnancy: A Report of Four Cases and Review of the Literature

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Abstract | **Case Series**

Introduction: Thermal burns during pregnancy represent a rare and complex clinical situation requiring multidisciplinary management to ensure maternal safety while preserving fetal well-being. Severity depends particularly on burn extent and depth, as well as gestational age. ***Objective:*** To report our experience in the management of thermal burns during pregnancy through a series of four cases and to discuss the specific aspects of their management in light of the literature. ***Patients and Methods:*** This retrospective descriptive study included four pregnant women who sustained thermal burns and were managed at the Burn Unit of Mohammed VI University Hospital in Marrakech, Morocco, between June 2025 and July 2026. ***Results:*** The mean maternal age was 25.75 years, ranging from 18 to 34 years. Gestational age ranged from 12 to 40 weeks. Total body surface area (TBSA) burned ranged from 6% to 55%. Three burns were caused by butane flame exposure and one by hot-water scalding. Two patients had superficial second-degree burns and two had deep burns. Three patients survived, whereas one patient with burns involving 55% of TBSA died on the first day of hospitalization. The three survivors received nutritional support consisting of a high-calorie, high-protein diet, together with iron and vitamin supplementation. One of them developed deep vein thrombosis of the right common femoral vein, treated with oral anticoagulation for three months, before readmission for skin grafting. ***Conclusion:*** Thermal burns during pregnancy require individualized and multidisciplinary management. Coordination between burn care, intensive care, obstetric, nutritional, and psychological teams plays an essential role in the care of these patients.

Keywords: Thermal burns; pregnancy; pregnant women; multidisciplinary management; deep vein thrombosis; skin grafting.

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INTRODUCTION

Thermal burns in pregnant women represent a specific clinical situation, combining the pathophysiological consequences of thermal injury with the physiological changes of pregnancy. Their management is a major therapeutic challenge because both maternal prognosis and fetal outcome must be considered.

Burn severity mainly depends on the extent and depth of the injury, its mechanism, and the occurrence of possible systemic complications. In pregnant women, these factors are compounded by the cardiovascular, respiratory, metabolic, and hemodynamic changes associated with gestation.

The therapeutic strategy is based on appropriate resuscitation, local wound treatment, regular obstetric monitoring, and surgical management when necessary. A multidisciplinary approach is essential to optimize maternal and fetal outcomes.

Through this study, we report four cases of pregnant women who sustained thermal burns and were managed at the Burn Unit of Mohammed VI University Hospital in Marrakech, and discuss the specific aspects of their management.

PATIENTS AND METHODS

This retrospective descriptive study included four pregnant women who sustained thermal burns and were admitted to the Burn Unit of Mohammed VI University Hospital in Marrakech, Morocco, between June 2025 and July 2026.

The data collected included maternal age, gestational age, burn mechanism, total body surface area (TBSA) burned, burn depth, therapeutic management, and maternal and obstetric outcomes.

Common Therapeutic Management

Initial management consisted of fluid and electrolyte resuscitation according to the Evans formula, tulle gras dressings, and analgesia with paracetamol. Obstetric ultrasound monitoring was performed in all patients, with an ultrasound examination at admission and a follow-up examination during hospitalization.

The three surviving patients received individualized nutritional support consisting of a high-calorie, high-protein diet, together with iron and vitamin supplementation. The patient who required skin grafting also received psychological and nutritional consultations. Gynecological follow-up was arranged after hospital discharge for all three survivors.

Case Presentations

Case 1

A 24-year-old woman at 27 weeks of gestation was admitted with thermal burns caused by a butane flame. The total body surface area burned was estimated at 11%. The lesions were classified as superficial second-degree burns.

The clinical course was favorable, and the patient was discharged after eight days of hospitalization.

Case 2

An 18-year-old woman at 22 weeks of gestation was admitted following a hot-water scald sustained in a traditional bathhouse. The total body surface area burned was 6%, with superficial second-degree lesions.

The outcome was favorable, and the patient was discharged after five days of hospitalization.

Case 3

A 27-year-old woman at 40 weeks of gestation was admitted with deep thermal burns caused by a butane flame, involving 25% of the total body surface area. Escharotomies were performed at the level of the neck and upper limbs.

From an obstetric perspective, delivery by cesarean section resulted in the birth of a live newborn.

The maternal course required initial admission to the intensive care unit, followed by transfer to the surgical intensive care unit and subsequently to the Burn Unit. The hospital stay lasted approximately one and a half months.

During hospitalization, the patient developed deep vein thrombosis of the right common femoral vein. Oral anticoagulation was initiated for three months. After follow-up confirmed resolution of the thrombosis, the patient was readmitted for skin grafting.

Case 4

A 34-year-old woman at 12 weeks of gestation was admitted with severe thermal burns caused by a butane flame, involving 55% of the total body surface area. The lesions were deep and required escharotomies. Despite the treatment initiated, the clinical course was unfavorable, and the patient died on the first day of hospitalization.

RESULTS

Our series included four patients aged between 18 and 34 years, with a mean age of 25.75 years. Gestational age ranged from 12 to 40 weeks, corresponding to one first-trimester case, two second-trimester cases, and one third-trimester case.

The total body surface area burned ranged from 6% to 55%, with a mean of 24.25%. The mechanism was butane flame exposure in three cases (75%) and hot-water scalding in one case (25%).

Regarding burn depth, two patients presented with superficial second-degree burns, while two had deep burns. The latter required escharotomies.

Regarding outcomes, three patients survived and one died on the first day of hospitalization. A live birth by cesarean section was reported in the patient admitted at 40 weeks of gestation.

All three surviving patients received individualized nutritional support consisting of a high-calorie, high-protein diet, together with iron and vitamin supplementation. The patient who required skin grafting also received psychological support and nutritional consultations. Her clinical course was complicated by deep vein thrombosis of the right common femoral vein, treated with oral anticoagulation for three months. She was subsequently readmitted for skin grafting after resolution of the thrombosis had been confirmed.

The initial hospital stays were eight days for the first patient, five days for the second patient, and approximately one and a half months for the third patient, before her subsequent readmission for skin grafting.

Summary of the Four Cases

Parameters	Case 1	Case 2	Case 3	Case 4
Age (years)	24	18	27	34
Gestational age (weeks)	27	22	40	12
Mechanism	Butane flame	Hot water	Butane flame	Butane flame
TBSA burned (%)	11	6	25	55

Burn depth	Superficial second-degree	Superficial second-degree	Deep	Deep
Escharotomies	No	No	Yes	Yes
Maternal outcome	Favorable	Favorable	Survival	Death
Length of hospital stay	8 days	5 days	Approximately 1.5 months	1 day

DISCUSSION

Thermal burns during pregnancy are a rare clinical situation that presents particular management challenges. They expose the mother to the systemic complications of thermal injury and may compromise fetal outcome. The therapeutic strategy must therefore be individualized according to burn severity, gestational age, and clinical course.

1. Epidemiology and Mechanisms of Burns

In our series, butane flame burns were the most frequent mechanism, occurring in three of the four patients. One patient sustained a hot-water scald in a traditional bathhouse.

This distribution highlights the role of domestic accidents and thermal exposures in burn injuries among pregnant women. Prevention remains important, particularly in settings where the use of butane gas and domestic activities may expose individuals to burn hazards.

2. Burn Severity and Physiological Changes During Pregnancy

Burn severity mainly depends on the extent and depth of the injury and its mechanism. Pregnancy adds further complexity because of maternal physiological changes, particularly cardiovascular and metabolic adaptations.

In our series, TBSA burned ranged from 6% to 55%. The death occurred in the patient with the largest burn area, estimated at 55%. This observation underscores the importance of burn extent in maternal prognosis.

3. Resuscitation and Therapeutic Management

Fluid and electrolyte resuscitation is a fundamental step in the management of major burns. In pregnant women, it must be conducted with particular care to maintain adequate maternal and placental perfusion.

In our series, fluid and electrolyte resuscitation was performed according to the Evans formula. Local treatment consisted of tulle gras dressings, and analgesia was provided with paracetamol.

Deep burns required escharotomies in two patients. In the third case, these incisions were performed at the level of the neck and upper limbs. Such procedures are part of the surgical management of deep burns when decompression is required.

4. Obstetric Monitoring and Fetal Outcome

Obstetric monitoring plays an essential role in the management of burns during pregnancy. It allows fetal well-being to be assessed and obstetric management to be adapted according to gestational age and maternal condition.

In our series, all patients underwent obstetric ultrasound at admission, followed by a control examination during hospitalization. In the patient admitted at 40 weeks of gestation, delivery by cesarean section resulted in the birth of a live newborn.

The decision to deliver should be individualized and discussed according to gestational age, maternal condition, and obstetric assessment.

5. Nutritional and Psychological Management

Extensive burns induce a hypermetabolic state and increase the energy and protein requirements needed for wound healing. Nutritional support is therefore an important component of comprehensive burn care.

In our series, all three surviving patients received an individualized high-calorie, high-protein diet, together with iron and vitamin supplementation. The patient with the most complex clinical course, marked by deep vein thrombosis and the need for skin grafting, also received nutritional and psychological consultations.

This multidisciplinary approach addresses the metabolic requirements associated with wound healing and the psychological impact of the traumatic event. Psychological support is particularly important in pregnant women, given the emotional and obstetric dimensions of this situation.

6. Thromboembolic Complications

Patients with major burns are at risk of several systemic complications, including thromboembolic events. Immobilization, systemic inflammation, and the physiological changes of pregnancy may contribute to an increased thrombotic risk.

In our series, the patient with deep burns involving 25% of the total body surface area developed deep vein thrombosis of the right common femoral vein during hospitalization. Oral anticoagulation was prescribed for three months. After follow-up confirmed

resolution of the thrombosis, the patient was readmitted for skin grafting.

This case highlights the importance of monitoring for thromboembolic complications in pregnant women with burn injuries, as well as the need for coordination between burn specialists, intensive care teams, and other relevant specialists.

7. Maternal Prognosis and Multidisciplinary Management

The prognosis of burns during pregnancy depends on several factors, including the extent and depth of the injury, systemic complications, and gestational age.

In our series, three patients survived, while one patient with burns involving 55% of the total body surface area died on the first day of hospitalization. The patient with deep burns involving 25% TBSA required prolonged management, complicated by deep vein thrombosis and followed by skin grafting.

These observations highlight the importance of multidisciplinary management involving burn specialists, intensive care teams, obstetricians, surgeons, and nutrition and psychological care professionals.

CONCLUSION

Thermal burns in pregnant women represent a complex medical and surgical emergency requiring individualized and multidisciplinary management. Burn severity, extent, and the occurrence of systemic complications directly influence maternal and obstetric prognosis.

Our series highlights the importance of appropriate resuscitation, adequate local and surgical treatment, regular obstetric monitoring, and individualized nutritional support. Iron and vitamin supplementation, attention to thromboembolic complications, and psychological support also contribute to the quality of care.

Close collaboration between the different specialties is essential to optimize maternal and fetal outcomes.

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