A COMPARATIVE STUDY OF EARLY-DELAYED SKIN GRAFTING AND LATE OR NON-GRAFTING OF DEEP PARTIAL THICKNESS BURNS AT THE UNIVERSITY TEACHING HOSPITAL

BY

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A dissertation submitted in the partial fulfilment of the requirement for the award of the master of medicine general surgery degree of the University of Zambia**.**

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APPROVAL

This dissertation for **Dr. MIRIAM MAIMBO** is approved in partial fulfillment of the requirements for the award of the Master of Medicine in Surgery by the University of Zambia.

EXAMINERS

	Signature	Date
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COPYRIGHT DECLARATION

I, **Dr. Miriam Maimbo,** hereby declare that this dissertation represents my own work and that it has never to my knowledge been previously published in part or in full for a diploma or degree at any university. Acknowledgement for referenced materials has been appropriately made.

I have read this dissertation and submit it for examination.

Sign……

Date……

ACKNOWLEDGEMENTS

I would like to thank the Almighty God for his continuous blessings and support throughout my life to bring me this far.

My love and appreciation to my husband, children, parents and siblings. for their patience in tolerating an absent wife, mother, daughter and sister.

To my father and mother I will ever be grateful for teaching me what the definition of being humble is and for instilling in me not to fear but to embrace hard work.

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Last but not least I would like to thank all those who directly or indirectly assisted me to ensure the research was carried out.

Dr. M. Maimbo Sign……

Date……

CERTIFICATION

This is to certify that this dissertation entitled “A comparative study of early-delayed skin grafting and late or non-grafting of deep partial thickness burns at the University Teaching Hospital” By **Dr. Miriam Maimbo** is now ready for examination.

Supervisor: Dr. G. Jovic

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GLOSSARY

AUTOGRAFT: Graft derived from one part of a patient's body and used on another part of that same patient's body

CONTRACTURE: Shrinkage of burn scar through collagen maturation.

COLLAGEN: Protein present in skin, tendon, bone, cartilage and connective tissue.

DERMIS: The second layer of skin containing sweat glands, hair follicles and nerves.

DONOR SITE: The area from which skin is taken to provide a skin graft for another part of the body

EPIDERMIS: The outermost layer of skin

EXCISION: Surgical removal of tissue

HYPERTROCHIC SCAR: Excessive scar formation that rises above the level of the skin.

SSG: Split skin graft

EDSSG- Early-delayed split skin graft

LNSSG- Late or non-split skin graft

GREEN FIRM: The surgical department at the University Teaching Hospital has five surgical units that are named Green,yellow,white,blue and red firms. Each surgical unit has a specific day when they are on call and admit patients to the hospital.

MINOR BURNS: First- or second-degree burns covering less than 15% of an adult's body or less than 10% of a child's body, or a third-degree burn on less than 2% body surface area.

MODERATE BURNS: First- or second-degree burns covering 15%-25% of an adult's body or 10%-20% of a child's body, or a third-degree burn on 2%-10% body surface area.

MAJOR BURNS: These are defined as first- or second-degree burns covering more than 25% of an adult's body or more than 20% of a child's body, or a third-degree burn on more than 10% body surface area. In addition, burns involving the hands, feet, face, eyes, ears, or genitals are considered critical

FIRST DEGREE BURN: Constitutes minor epithelial damage to the epidermis. It is characterised redness, tenderness, pain. It is often referred to as Sunburn

SECOND DEGREE BURN: Involves the epidermis and dermis and is described as being either superficial partial thickness or deep partial thickness.

SUPERFICIAL PARTIAL THICKNESS: Involve the epidermis and papillary dermis. In this type of burn the skin appendages are viable. The burn wound is pink, moist and tender. It heals with minimal scarring due to outgrowths of epithelial buds from viable appendages.

DEEP PARTIAL THICKNESS: Burn extends to reticular dermis. The wound appears dark, red or has a yellow mottled colour.

THIRD DEGREE: This is a full thickness burn that involves the epidermis and dermis it appears white or charred. There is complete loss of capillary bed and nerve endings.

FOURTH DEGREE

Full thickness destruction of skin and subcutaneous tissue with involvement of underlying fascia, muscle, bone and other structures.

TOTAL BODY SURFACE AREA (TBSA): The term is used to describe the skin surface area that has been burnt.(See Appendix 7)

ABSTRACT

A comparative study of early-delayed skin grafting and late or non-grafting of deep partial thickness burns at the University Teaching Hospital (UTH) was carried out over a period of 18 months. This was after an observation that at U.T.H there is no standard of care for timing of performing a skin graft post burn. The objective of the study was to demonstrate the benefits of performing a split skin graft within 15 days post burn and explore the differences in duration of hospital stay, infection and contracture formation in comparison to standard care provided at U.T.H. In total 78 patients with deep partial thickness burns were enrolled in the study. Among them, 43 (55.1%) subjects were assigned to receive an early-delayed skin graft (grafted within 15 days), and 35 (44.9%) to receive current standard treatment provided at U.T.H (late or no split skin grafting). Age distribution was 2 months to 84 years. It was noted that 49(62.8%) of patients were below the age of 5 years. Sex distribution was 57.7% male and 42.3% female. The patient's assigned to early-delayed split skin graft 23 (29.5%) were male and 20 (25.6%) female. Those that were assigned to standard treatment offered at UTH were male 22 (28.2%) and female 13 (16.7%).In both groups the most common cause for burns was hot water (57%) with 24% in the group assigned to receive an early-delayed ssg and 33% in the late or non-ssg group. The time it took for patients to present to the hospital post burn was noted and it was found that 86% of patients presented to the hospital within 24 hours post burn. Early–delayed split skin graft was found to statistically significantly reduce length of stay and occurence of infection as opposed to late or non ssg.No statistically significant relation could be established for occurence of contractures due to loss in follow up of patient valuable information was lost.

A common feature noted in the two groups was the reluctance to have the procedure performed. Patients, parents and guardians often declined to have skin grafting performed within 15 days with consent being obtained after 21 days when they were convinced the burn would not heal without the intervention. This study shows that even if early-delayed SSG were to be offered at UTH there is need to carry out awareness campaigns to change peoples attitudes towards the surgical procedure (SSG). This is an approved treatment world-wide which has not gained wide acceptance amongst patients presenting to U.T.H that participated in this study. Patient attitudes and perceptions need to be changed as SSG currently is not seen as a curative treatment but as added injury to an already injured patient.This study showed that the patients who underwent early-delayed split skin grafting showed good outcomes.

1.0 INTRODUCTION

Burn injuries are caused by various agents such as thermal agents (scalds and flames), ultraviolet light, ionizing radiation, chemicals and electricity. They are a serious global health threat to all. In 2002, the World Health Organization (WHO) reported that this threat is disproportionately concentrated in Southeast Asia and Africa. In sub-Saharan Africa it is estimated that 18,000 – 30,000 children younger than the age of five die annually as a result of fire related injuries. (1) Burn injuries are among the common reasons for admission to the surgical unit at the University Teaching Hospital (UTH) in Lusaka, Zambia. A review of records in the female and male surgical admission wards over an eight month period from January - August 2008 indicate a total of 10,152 admissions;, 682 (6.7%) of these were burn patients. Four hundred forty three out of 682 (65%) were under the age of 5 years.

Skin grafting is a surgical procedure in which skin or a skin substitute is placed on an excised burn or non-healing wound. The purpose of the skin graft is to permanently (auto-graft) replace damaged or missing skin or to provide a temporary wound covering (allograft or xenograft). The aim is to protect the body from fluid loss, to aid in temperature regulation, and to avoid infections. The skin graft also prevents the development of severe contractures and plays a major role in the management of burns.

For superficial partial thickness burns (II degree A), skin grafting is generally not required because these burns usually heal with little or no scarring in 14 to 21 days if not infected. Deep partial thickness burns (II degree B) and third degree burns show loss of key dermal elements that are critical for normal healing.(2) These burn types will require skin grafting because when left to heal without any intervention they lead to scarring and contracture formation. Contractures limit mobility and normal function of the affected body part. To optimize outcomes, skin grafting should be performed as soon as the clinician realizes the wound will not heal within 14 days.

Skin grafting is performed at UTH, however the optimal time between injury and skin grafting has not been defined. Reasons for this are not clear, and the result is that either skin grafting is delayed or it is not performed at all. In this prospective study, early-delayed (within 15 days post burn injury) skin grafting of deep partial thickness burn wounds in patients that presented to the researcher attached to Green firm were performed in phase V

and phase III theatres at the University Teaching Hospital. Outcomes were compared with burns patients that presented to Blue Firm.

The two units were selected because they had the same burns management protocol and grafted their patients on no specific day post injury. The patients that presented to Blue firm were observed/ monitored and received the standard treatment according to the burns management protocol that all the burns patients in this unit received.

2.0 LITERATURE REVIEW

A study performed at Shriners Hospital, Galveston, USA over a period of 5 years (1995-1999) included 157 children with acute burns covering ≥ 40% total body surface area. They were admitted to the institution within 2 weeks of injury (3). Among them, 86 patients were grafted within 24 hours of the burn injury, 42 patients were grafted between days 3-6 post burn, and 29 patients were grafted days 7-14 after burn injury. The results showed that mortality, number of operative procedures, and blood transfusion requirements were not different between groups. Based on this information, the study defined patients who underwent auto grafting within this period as the early–delayed skin graft (within ≤ 15 days). Early closure of burn wounds by excising the burned tissues (escharectomy) and promptly covering it with a skin graft or its substitutes within the first five days post-burn is the standard technique of burn wound management in burn units of developed countries especially burns that are third degree in depth. For burns that are indeterminate in depth a period of up to 10 days or even two weeks, before operating may be required. However, in low and middle income countries, "delayed primary" is the alternative to the "early" burn-wound excision and closure, as shown in a study done at Khoula Hospital, in Oman (4).Oman at the time of this study was not a high income country. In this study the term “delayed primary” referred to Skin grafting performed beyond 6 days to the 11-12 days post burn, the results of which were analysed retrospectively. During a period of 4 years ending in December 2001, 143 patients out of 592 admissions to the burns unit were subjected to burn wound excision and auto-grafting. Eighty-seven percent of the patients had "delayed primary” and 13% had "early"(within 6 days post burn) surgery. The results showed no mortality or post-operative morbidity in these operated patients. However, due to the non-availability of skin substitutes, excision and auto-grafting could not be done in extensive burns because there were inadequate skin donor sites. The maximum total body surface area burn treated by delayed primary surgery was 50% in children and 55% in adults. The outcome was good functionally as well as cosmetically. The authors concluded that “delayed primary" skin grafting is the best alternative to the “early” burn wound excision and closure with similar advantages of reducing the risk of septicaemia, mortality and morbidity rates, length of hospital stay, and cost of treatment. It was concluded that delayed primary burn wound closure was preferred over secondary skin grafting of granulating wounds. The author also concluded that in developing countries, the circumstances that commonly lead to delayed primary burn surgery are patients too unstable or unfit for surgery during the first

post-burn week, delay in transferring patients to the hospital, or delay in getting consent for surgery. Other factors for delay are major burns with no available skin substitutes and lack of operating time. At UTH the skin grafts that were performed at the time of the study were delayed and placed over granulating wounds. It could be that the factors mentioned are present at U.T.H however this has not been documented.

A study carried out in Manipal, India by Prasanna *et. al*. assessed the feasibility of performing early tangential excision and skin grafting for burn wounds routinely in a developing county (5). An analysis of mortality, morbidity and hospital stay was carried out for 90 out of 202 burns patients with deep partial skin loss who underwent early tangential excision and skin grafting. Overall survival rate was 86.5%. Children below 14 years of age with burns ≤ 40% TBSA had no mortality, and 93.5% of adult patients with burns of ≤ 60% TBSA survived, in contrast to those with burns of > +60% TBSA who all died. Morbidity for contractures and hypertrophic scars was nil to minimal. The mean hospital stay for adult patients with major burns was 30 days and with those with minor burns it was 18 days. The study concluded that in developing countries, early tangential excision and skin grafting can and should be done routinely for all minor and major burns who are admitted to a well-equipped burn centre, but not for very extensive burns, until biological skin substitutes are more readily available. In view of the high mortality in patients with burns with TBSA > 60%, patients with such burns were excluded from this study.

Muangman P et al studied the optimal time for early excision in major burn injury (6). This was a retrospective study of patients admitted between January 1994 and December 2000 with ≥ 40% TBSA burns who underwent at least 1 excision and grafting procedure. The patients were grouped according to the day of their first operation. The authors correlated the time of first excision with infection, mortality and length of stay. Seventy-five patients were identified; 12 patients healed prior to excision and grafting and were excluded. The mean burn size was 49% TBSA and mean age was 36 years. Twelve patients died (19%). There was no statistical difference in mortality for patients operated on different days within the seven days post injury ($p>0.2$). The study also showed that patients who undergo early excision and grafting within seven days following a major burn ≥ 40% TBSA have equivalent infection or mortality rates regardless of when the first operation occurs between post burn day (PBD) 2 and PBD 7 ($p > 0.2$).

This Study did not exclude any age group. This was based on a study that showed that the elderly still benefit from a skin graft. This study was done to establish if an early surgical approach is safe in elderly burn patients (7). In this prospective study of early skin grafting in 114 consecutive patients over the age of 50 years, patients were generally operated on between post burn days 2 and 5. The mean age of patients was 68 years with a burn size of 22%, of which 13% was full thickness. The results showed that the mean hospital stay of the surviving patients was reduced by 40% compared to national averages ($p < 0.0001$).

Another study looked at an early surgical approach to burns in elderly patients. Fifty-two consecutive patients over the age of 65 years were grafted within 14 days post burn. The results showed a 32% reduction in mean hospital stay ($p< 0.05$). In addition, early surgical excision resulted in fewer episodes of sepsis and pneumonia ($p< 0.05$). The study concluded that elderly patients represent a high-risk population, and that early surgical excision results in fewer episodes of infection and a reduction in hospital stay (8).

A comparative study of conservative versus early excision was done in Texas in 1989 (9). At the time, early excision and grafting of small burn wounds was generally accepted treatment but early excision of burn injuries > 30% TBSA in adults was not universally accepted. In this study, 85 patients, whose ages ranged from 17 to 55 years with > 30% TBSA were randomly assigned to either early excision or topical antimicrobial therapy and skin grafting after spontaneous eschar separation.

Mortality from burns was significantly decreased by early excision from 45% to 9% in patients who were 17-to 30 years of age ($p< 0.025$). No differences in mortality could be demonstrated between therapies in adult patients older than 30 years of age. Possible factors that could have contributed to this are not elaborated further.

In a study carried out in Harare, 451 patients admitted to the burns unit were prospectively studied and the outcome of treatment evaluated (10). The median age was 6 years (range: 1 month to 71 years). The overall median total body surface area burn was 13% (0.5- 99%). Delayed split skin grafting was done on 26% of the patients and early primary excision and skin grafting on 3%. The median hospital stay for patients with delayed split skin grafting was 42 days and that for those with primary excision and split skin grafting was 17 days. It was concluded from this study that burn primary excision and grafting reduced hospital stay by 60% compared to delayed skin grafting.

A study that focused on burns patients admitted to a paediatric ward showed that apart from causing death and injury, burns may leave disabling scars not only to the skin or the body of the child, but also to his or her psyche. Burns are amongst the most traumatic injuries and may impose significant psychological, educational, social, and future occupational impairment to the young child (11).

The purpose of this study was to show that early-delayed skin grafting can be safely performed on patients at UTH. Secondary outcomes demonstrate that not only is it feasible but also beneficial in reducing mortality/morbidity, length of stay, and complications. The literature reviewed revealed that studies in relation to early skin grafting was started as early as 1987 in high income countries. The only research in Africa quoted in literature was from Zimbabwe in 1999. This study was aimed at improving management of burns patients at the UTH by obtaining the relevant data that shows how early skin grafting can be performed safely with improved patient outcomes and shorter hospital stays.

3.0 STATEMENT OF THE PROBLEM

There is no standard of care for timing of performing skin grafting at UTH

3.1 RATIONALE

Many admitted to UTH are patients who have sustained deep partial and full thickness burns from various sources including hot fluids, flames, steam, chemicals and electricity. These patients usually endure a long hospital stay either due to slowly healing burn wounds, to malnutrition, or to hospital-acquired infection. While some burn patients (mostly burns >10 %, that are not superficial burns) will receive a skin graft, a number of patients are discharged from hospital and given out patient clinic review dates without having had a skin graft performed. Some of these are lost to follow-up; others will attend the out-patient clinic and either be grafted at a much later date or not at all. The patients who would benefit from burn wound excision and skin grafting but do not receive a skin graft usually develop hypertrophic scars or contractures.

The purpose of this study was to show that early-delayed grafting could be done at UTH, and that grafting burn wounds within 10 to 15 days would reduce hospital stay and improve the outcome of the wounds. Early-delayed grafting of these wounds would also reduce infection in patients and post injury complications.

3.2 NULL HYPOTHESIS

There are no differences in length of hospital stay, occurrence of infection, and contractures for deep partial thickness burn wounds between those who receive an early delayed ssg (within 15 days) or late or non-ssg

3.3 JUSTIFICATION OF THE STUDY

Early-delayed grafting has been shown to be preferred to late or non-grafting of deep partial burns as illustrated in the literature review. Early-delayed grafting is not standard treatment for deep partial thickness burns at UTH despite demonstrations of its advantages in other countries. The benefits of early-delayed grafting have not been demonstrated in the UTH setting. While it can be acknowledged that early skin grafting of burn wounds requires more resources than are available in low income countries, the literature shows that performing early-delayed skin grafting is then the alternative. This study aims to illustrate that the proposed benefits of early-delayed grafting would reduce the number of infections, shorten hospital stay, and improve functional outcomes in burn patients treated at UTH.

4.0 OBJECTIVES

4.1 BROAD OBJECTIVE

To improve the care of burn patients treated at UTH by demonstrating that grafting deep partial thickness burn wounds within 15 days reduces hospital stay and improves outcome in patients.

4.2 SPECIFIC OBJECTIVES

a. To explore the differences in duration of hospital stay between patients who receive an early-delayed skin graft and those who do not.

b. To evaluate the differences in infection at burn site between patients who receive an early-delayed skin graft and those who do not.

c. To assess the differences in wound healing, presence of contractures in burns patient, who receive an early-delayed skin graft and those who do not.

5.0 METHODS

5.1 STUDY DESIGN

This was a prospective, non-randomized, interventional study involving patients with deep partial thickness burn wounds at UTH. Study subjects were assigned to either receive an early-delayed skin graft, or the standard treatment at the time based on the firm to which they were admitted. Green firm patients were given the option of having an early-delayed skin graft while Blue firm patients were treated using the standard Blue firm treatment protocol. Funding for the study was provided by the Ministry of Health and the Researcher.

5.2 DESIGN JUSTIFICATION

Although it has been shown that early-delayed skin grafting offers better treatment outcome, this had not been demonstrated in the Zambian setting. This study aimed to show that it is possible to conduct early-delayed skin grafts and obtain improved treatment outcomes. All patients who met the study criteria in Green firm and consented to participate in the study were offered an early-delayed skin graft. Patients who opted to have the skin graft were then compared to patients from Blue firm, where early-delayed skin graft was not offered as part of standard treatment.

Subjects presented to the two surgical firms (Blue and Green firm).These are two surgical firms that are on call on different days. The patients admitted on their call day are admitted to their care. They are a sample being drawn from that part of the population and selected because they are readily available. Convenience sampling was used to gather subjects for this study.

The two general surgical firms were selected based on their similarity in management of the burns patients under their care. These two firms at the time of the research used wet soaks to dress the wounds and did not use paw paw or flamazine as used by the other firms.

5.3 STUDY SITE

The Study was carried out at the University Teaching Hospital (UTH), in Lusaka, which is the largest hospital in Zambia. It provides a full range of primary, secondary, and tertiary health services on both an inpatient and outpatient basis.This center receives specialist referrals from across the country. Zambia currently does not have a specialized burn centre and so burn victims from within Lusaka as well as across the country are treated at U.T.H.Patients recruited into the study were identified from the female and male surgical admission wards as well as the Green and Blue firm surgical wards.

5.4 SAMPLE SIZE

The objective was to choose a sample size such that if there is clinically important difference between the groups, the study has a good chance of finding a statistically significant difference between them. The study needs to find out how many patients with burns would need to be recruited into a trial, in order to detect an average difference of 15 days in hospital stay between an intervention group who receive an early-delayed skin graft and a control group (who receive standard burns treatment). The basic equation for calculating the sample size is shown below. The number of participants required in each intervention group, *m*, is given by:

$$m = 2 \times [z_{(1-\alpha/2)} + z_{(1-\beta)}]^2 / \Delta^2$$

Where z (1-α/2) and z(1-β) represent percentage points of the normal distribution for statistical significance level and power, respectively and Δ represents the standardised difference (i.e. the treatment difference divided by its standard deviation). Other assumptions made are that:–

- ☐ Equal allocation of participants to each of two treatment groups
- ☐ 2-sided statistical tests are to be used using a normal assumption or approximation

Assuming the standard deviation (a measure of the patient-to-patient variability) of hospital stay is 30 days, we set the α (Type I) error at 5% and the β (Type II) error at 20%.

First, calculate Δ, the standardised difference, sometimes called the effect size. In the case of two means, μ_1 and μ_2, with a common standard deviation (SD).

$\mu_1 - \mu_2 / S = \Delta$, the standardised difference

In this study, we calculate the standardised difference to be 15/30 = 0.5.

Using a significance level of 5%, z (1- α /2) = 1.96, and a power of 80%, z (1- β) = 0.8416

$$m = 2 \times [1.96 + 0.8416]^2 / (0.5)^2 = 63$$

Taking into account losses to follow-up, 20% contingency is included, making the number of patients to be 75.

5.5 INCLUSION CRITERIA

- Adults and children
- 5 - 36% total body surface area deep partial thickness burns.
- Haemoglobin level >8 g/dl
- Informed consent provided by patient, parent, or guardian.

5.6 EXCLUSION CRITERIA

- Patients with concomitant inhalation burns.
- Patients with electrical or chemical burns.
- Patients with infected burns.
- Patients with burns > 7 days old.
- Informed consent not obtained.
- Co-morbidity (Eg. malnutrition, anaemia)

5.7 RECRUITMENT

Patients that fit the recruitment criteria were identified by the researcher were identified from the male and female surgical admission wards during Blue and Green firm admission days, and from the Blue and Green firm surgical wards. The patients were asked to participate in the study after the study information has been presented to them. If the patient was willing to participate, they were asked to sign a consent form. The choice of an early-delayed skin graft or the standard Green firm burns treatment protocol was offered. Patients in Blue firm received the standard Blue firm burns treatment and their progress and outcome monitored. Consent was obtained from for blue firm patients to only allow the researcher to monitor and follow up their treatment and outcome.

5.8 GRAFT PROCEDURES

Heaters were placed in the theatre to warm up the room before the patients were wheeled in. Napkins, basins and Jik solution, were provided to the patients on admission for cleaning of the burns, and for application of wet soaks. Post-operatively the graft area (recipient) was exposed 5 days after the skin graft operation. The patient would be taught how to clean and care for the wound and was discharged 48 hrs after the recipient area was exposed.

5.9 PATIENT FOLLOW-UP

All patients recruited (those who had received an early-delayed graft, and those who had not) were followed-up by the researcher in Clinic 4 during their normal scheduled appointment. Patients were seen at their clinic review up until 6 months after discharge from hospital. Treatment responses, including wound healing, were assessed. A data collection sheet was used (see Data collection sheet in Appendix 1)

5.10 STUDY LIMITATIONS

The use of convenience sampling introduced the risk for bias. Also while this was the appropriate method of sampling for this study the results could not be used as a generalization for the population.This study included a follow up component where patients were followed up after discharge from hospital, and a major concern was the number of patients that were lost to follow up.

5.11 TIME FRAME

The study was performed from May 2010 to December 2012.

5.12 DATA MANAGEMENT AND ANALYSES

Written consent was sought from the patients, parents or guardians of those recruited for the study. A standardized questionnaire was used to collect clinical data such as date of admission, date of operation, length of hospital stay, infection, and mortality. Data collected was analyzed using Statistical Package for the Social Sciences (SPSS) 20.0.

6.0 ETHICAL CONSIDERATIONS

Ethics approval was obtained from the University of Zambia Ethics Committee. The purpose, procedures benefits and risks of the study were fully explained to patients, guardians and parents. Patients recruited were asked to sign a consent form after a clear explanation of the study had been given to them. The study information was verbally explained to patients who could not read. It was made clear to the patients that their participation in the study was purely voluntary and that they were able to withdraw from the study at any time, without any prejudice to further medical care. Early-delayed skin grafts were offered to all Green firm patients meeting eligibility criteria. Patients who did not receive the skin graft received the available standard practice medical treatment. Co-existing illnesses in the patients were addressed and treatment given accordingly. Attached to the consent form was an information sheet that was well detailed in reference to the risks and benefits of the procedure and study as a whole.

7.0 RESULTS

A comparative study of early-delayed skin grafting and late or non-grafting of deep partial thickness burns at the U.T.H was carried out over a period of 18 months. In total, 78 patients with deep partial thickness burns were enrolled in the study. This included 43 patients from the Green Firm who consented to participate in early-delayed grafting, and 35 patients from the Blue Firm who served as concurrent controls receiving standard treatment available at U.T.H.

7.1 Characteristics of the participants

Forty-three (55.1%) patients allocated to receive an early-delayed ssg while 35 (44.9%) were assigned to the late or non-ssg group. The proportion of males was 23 (29.5%) in the early-delayed group and 22 (28.2%) in the late or non ssg group while the proportion of females was 20 (25.6%) in the early-delayed group and 13 (16.7%) in the late or non ssg group. The participants' age range was 2 months to 84 years. Forty-nine (62.8%) were 5 years and below, eight (10.3%) were aged 6-10 years, ten (12.8%) were aged 11-20 years, and eleven (14.1%) were aged 21 and above years (Table 1).

Table 1: Demographic characteristics of patients

		Category of patient (n=78)											
		EDSG						LNSG					
		Sex of patient						Sex of patient					
		male		female		Total		Male		female		Total	
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Age of patients	≤5	16	57.1%	12	42.9%	28	100%	13	61.9%	8	38.1%	21	100%
	6-10	1	16.7%	5	83.3%	6	100%	2	100.0%	0	0.0%	2	100%
	11-20	2	40.0%	3	60.0%	5	100%	2	40.0%	3	60.0%	5	100%
	≥21	4	100.0%	0	0.0%	4	100%	5	71.4%	2	28.6%	7	100%
	Total	23	29.5%	20	25.6%	43	55.1%	22	28.2%	13	16.7%	35	44.9%

7.2. Causes of Burns

The following were the main causes of burns, in their order of frequency, hot water (57%), flames (27%), hot food (i.e. cooking oil, porridge, beans [14%]), and chemicals (1%). In both groups the most common cause for burns was hot water, 19 (24%) in the early-delayed skin graft group and 26 (33%) in the late or non ssg group (Figure 1).

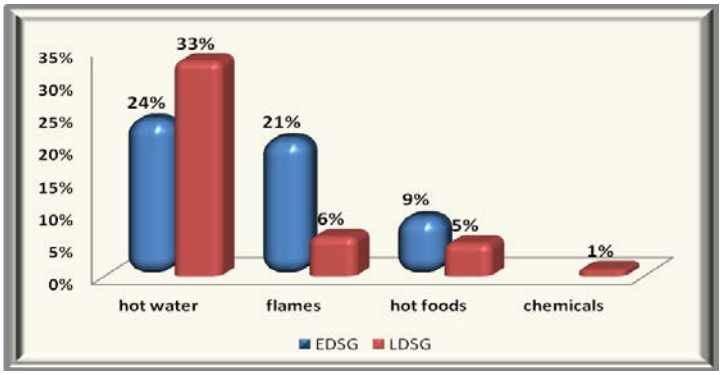

Figure 1: Causes of burns

7.3 Site of burn

In forty seven (60%) patients burns were observed to affect multiple regions of the body. (Table 7 .3 a and Table 7.3b)

Table 7.3a: Early-delayed ssg Group

TBSA	Frequency	Percent (%)
Head and Neck	2	4.7
Trunk	3	7.0
Upper limb	6	14.0
Lower Limb	4	9.3
Perineum	3	7.0
Multiple regions	25	58.1
Total	**43**	**100.0**

Table 7.3b: Late or non ssg group

TBSA	Frequency	Percent (%)
Head and Neck	2	5.7
Trunk	2	5.7
Upper limb	3	8.6
Lower Limb	6	17.1
Multiple regions	22	62.9
Total	**35**	**100.0**

7.4 Total body surface area

Burns affecting multiple regions involved on average 14% total body surface area (Table 2).

Table 2: Burn site/total body surface area

Sites	Total body surface area (mean %)	
	EDSG	LDSG
multiple regions	14	13
Trunk	11	8
lower limb	7	10
upper limb	6	7
head & neck	5	14
Perineum/pelvis	5	0

7.5 Time from burn to presentation to the hospital

Overall, 73 patients (93.6%) came from within Lusaka and 5 (6.4%) were from district hospitals outside Lusaka. It was also noted that 39(50%) were self referrals. Overall, 86% presented to the hospital within 24 hrs (Table 7.5a & 7.5b).

Table 7.5a: Early-Delayed ssg group

	Frequency	**Percent (%)**
1 day	37	86.0
2 days	1	2.3
3 days	1	2.3
4 days	2	4.7
Over 6 days	2	4.7
Total	**43**	**100.0**

Table 7.5b: Late or non ssg group

	Frequency	**Percent (%)**
1 day	30	85.7
2 days	1	2.9
3 days	2	5.7
6 days Over	2	5.7
Total	35	100.0

Table 8 Shows the summary of characteristics of study participants in the early delayed split skin group(EDSG) and late or non split skin graft group (LNSG); n = 78

Variable	**Mean/percentage**	
	EDSG	LNSG
Age	7 years	11 years
Gender	male – 29.5% Female – 25.6%	male – 28.2% Female – 16.7%
Commonest cause of burn	Hot water – 24%	Hot water –33%
Site of burn	Multiple regions – 58.1%	Multiple regions– 62.9%
Total body surface area	Mean -14% Range 5% -30%	Mean – 13% Range 5%-36%
Time to presentation to the hospital	< 24 hrs – 86%	<24 Hrs – 85.7%
region	93.6% from within Lusaka	93.6 % from outside Lusaka

Objective 1: To explore the differences in the duration of hospital stay between patients who receive an early-delayed skin graft and those who do not.

A Mann-Whitney U test was performed to establish whether hospital stay, measured using a continuous scale, differed in the two categories of patients (i.e. based on whether patients were treated within 15 days or after 15 days of presentation at the hospital. This test was conducted at significance levels of 0.05; with H_0: the distribution of the duration of hospital is the same across category of OPB. The results indicated that hospital stay in the late or non SSG group was statistically significantly higher than the early delayed SSG group (*U* = 305.500; *p* = .001). These results seem to suggest that patients SSG done within 15 days required a shorter duration of in-patient care than patients SSG done after 15 days.

Table 9: Mann-Whitney U Test results

Ranks

	Category of patient	N	Mean Rank	Sum of Ranks
Duration of hospital stay	EDSG	**43**	**26.73**	**935.50**
	LDSG	**35**	**49.90**	**2145.50**
	Total	**78**		

	Duration of hospital stay
Mann-Whitney U	**305.500**
Wilcoxon W	**935.500**
Z	**-4.497**
Asymp. Sig. (2-tailed)	**.001**

a. Grouping Variable: Category of patient

Objective 2: evaluate the differences in infection at burn site between patients who receive an early-delayed skin graft and those who do not.

A Chi Square test was performed to evaluate whether there were any differences in the occurrence of infection at burn site between patients who received early-delayed skin graft and those who did not (i.e. based on whether patients were treated within 15 days or after 15 of presentation at the hospital). This test was conducted at significance levels of 0.05; with H_0: there were no infection differences at the burn sites of both groups of patients. The results indicated that hospital stay in the late or non SSG group was statistically significantly higher than the early delayed SSG group (Chi Square = 4.510; p = .034). These results seem to suggest that patients SSG done within 15 days experienced less infection than patients SSG done after 15 days.

Table 10: Category of patient * Was there any infection experienced?

			Was there any infection experienced?		Total
			yes	no	
Category of patient	EDSG	Count	12	31	43
		Expected Count	16.5	26.5	43.0
	LDSG	Count	18	17	35
		Expected Count	13.5	21.5	35.0
Total		Count	30	48	78
		Expected Count	30.0	48.0	78.0

Table 11: Chi-Square Tests testing association between infection and treatment

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.510[a]	1	.034	.039	.029	
Continuity Correction[b]	3.571	1	.059			
Likelihood Ratio	4.529	1	.033	.039	.029	
Fisher's Exact Test				.039	.029	
Linear-by-Linear Association	4.452[c]	1	.035	.039	.029	.020
N of Valid Cases	78					

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 13.46.
b. Computed only for a 2x2 table
c. The standardized statistic is -2.110.

Objective 3: To assess the differences in would healing, presence of contractures in burns of patients, who receive an early-delayed skin graft and those who do not.

A Chi Square test was performed to evaluate whether there were any differences in patients experience of contractures between patients who received early-delayed skin graft and those who did not (i.e. based on whether patients were treated within 15 days or after 15 of presentation at the hospital). This test was conducted at significance levels of 0.05. The results indicated that experience of contractures in the late or non SSG group was not statistically significantly higher than the early delayed SSG group (Chi square = 0.999; p = .0.258). These results seem to suggest that there was no difference in the experience of contractures in patients SSG done within 15 days and patients SSG done after 15 days.

Table 12: Category of patient and Presence of contracture

			Presence of contracture		Total
			yes	no	
Category of patient	EDSG	Count	23	13	36
		Expected Count	24.5	11.5	36.0
	LDSG	Count	11	3	14
		Expected Count	9.5	4.5	14.0
Total		Count	34	16	50
		Expected Count	34.0	16.0	50.0

Table 13: Chi-Square Tests on Category of patient and Presence of contracture

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.999[a]	1	.318	.501	.258	
Continuity Correction[b]	.438	1	.508			
Likelihood Ratio	1.047	1	.306	.346	.258	
Fisher's Exact Test				.501	.258	
Linear-by-Linear Association	.979[c]	1	.323	.501	.258	.171
N of Valid Cases	50					

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.48.
b. Computed only for a 2x2 table
c. The standardized statistic is -.989.

Table 14: A summary of the findings* length of stay, infection and contracture formation

Objective		Length of hospital stay (days)	Infection (%)	Contracture formation (5)
Mean	EDSG n=43	Range - 11 to 20 Mean 16	27.9%	63.8%
	LNSG N= 35	Range -21-30 Mean – 25.5	51.4%	78.6%
Test		Mann-Whitney U	Pearson chi square	Fischer exact test
Results		U= 305.500 Z= -4.497	Chi square =4.510	Chi-square =0.999
P-value		0.001	0.034	0.258

8.0 DISCUSSION

Burns are amongst the conditions that present to the (UTH) surgical department admission wards and are a source of concern in view of the fact that from this study it was found that 62.8% of those presenting are under the age of five years, a vulnerable age group. This finding is in line with data in Sub saharan africa where annually 18 000-30 000 children younger than the age of five die annually of fire related injuries[1] It has been noted that children in africa have very high rates of burn injury and can often comprise more than 50% of all burn admissions and more than half of the DALYs lost globally to burns are among children below the age of 14 years [13] .These burn injuries have long lasting effects on children [11] . This research revealed the age range to be 2 months to 84yrs, exhibiting the extremes of age that are affected by burns. This vulnerable age group is most likely to sustain burn wounds; a possible explanation that has been given is their curious nature as soon as they are mobile and able to explore their surroundings makes them prone to burn injury [14] Sex distribution overall was 57.7% male and 42.3% female. The two groups were assessed and it was observed that in both groups the common causative agent was hot water. It was found that amongst those burnt with hot water males were most affected in both groups. In Punjab, India, a clinic-epidemiologic study was done that included 892 patients with burn injuries at a tertiary care hospital. Fifty four % of patients were male; however the commonest causative agent was flame burns in 72% with a peak age group 15-45 yrs.[12] (see Table 1, 8 & figure 1)

Skin grafting of burn wounds within five days post burn is standard treatment in high income country burn units. In low income countries, a study carried out in Khoula hospital in Oman [3] revealed that delayed primary closure was the alternative. One of the indications for delayed -primary closure that was cited in the research was delay in transferring of patients to the hospital. The delay in patients presenting to the hospital made an SSG within five days post burn impossible. Delay in presentation at the hospital was not a factor that affected patients presenting to UTH in reference to when the split skin graft was performed. In this study, the transport system to the hospital is adequate as noted in the high number of patients who arrive within the 24 hour post burn (see Table 7.5a & 7.5b). This suggests that the early presentation of patients to the hospital actually makes it feasible to perform an early delayed ssg at U.T.H. Another important aspect is the fact that 93% of patients were from within Lusaka highlights that burns patients are being treated within their regions

therefore there is need for further research to inform what outcomes after ssg occur in other health institutions around the country.

Amongst the enrolled participants at U.T.H, delay in providing consent for the procedure to be performed, was observed. Reasons given included waiting for consent from a spouse who was not in the hospital at the time. A prominent issue raised was the concern that the procedure involved harvesting skin from another site to place on the burn wound. The concept of a procedure meant to heal a burn wound involving the creation of another wound (donor site) was not well received. The delay in obtaining consent was also found in Khoula to be a contributing factor to the delay in performing an ssg[3] Also observed was that patients' parents or guardians were more willing to give consent after seeing another child in the same ward who had undergone an ssg successfully.The observed reluctance of patients and families to consent to surgery within the first two weeks after burns could suggest that a deliberate protocol at U.T.H to support early grafting of burns would be poorly received with patients opting for grafting after two weeks duration unless awareness strategies are in place. The range of total body surface area burned in recruited patients in this study 5% to 36%. Biological skin substitutes are not available at UTH so patients with larger burns were excluded [5]. In developing countries where no skin substitute exists, an alternative treatment for larger burn sizes would be to do the skin graft in stages. This would not be classified as an early delayed SSG as the duration post burn would be longer to allow for the site where the skin was harvested to regenerate. The mean values for total body surface area burn in each group were comparably similar (see table 7.3 & table 8).

The mean length of stay was 16 days in the early delayed ssg group and 25.5 days in the late or non- ssg .Performing an early delayed SSG (within 15 days) showed a 37% reduction in mean hospital stay (see table 8). In order to explore the differences in the duration of hospital stay between patients who receive an early-delayed skin graft and those who do not a Mann-Whitney U test was performed. This was done in order to establish if hospital stay using a continuous scale differed in the two categories of patients (i.e. based on whether patients were treated within 15 days or after 15 days of presentation at the hospital. This test was conducted at significance levels of 0.05; with H_0: the distribution of the duration of hospital is the same across category of OPB. The results indicated that hospital stay in the late or non SSG group was statistically significantly higher than the early delayed SSG group (U = 305.500; p = .001) (Table 9) These results seem to

suggest that patients SSG done within 15 days required a shorter duration of in-patient care than patients SSG done after 15 days.

The infection was noted to be lower in the early-delayed SSG group than the group that received current practice (see Table 14). The commonest causative organism was pseudomonas aueriginosa. To evaluate the differences in infection at burn site between patients who receive an early-delayed skin graft and those who do not A Chi Square test was performed to evaluate whether there were any differences in the occurrence of infection at burn site between patients who received early-delayed skin graft and those who did not (i.e. based on whether patients were treated within 15 days or after 15 of presentation at the hospital). This test was conducted at significance levels of 0.05; with H_0: there were no infection differences at the burn sites of both groups of patients. The results indicated that hospital stay in the late or non SSG group was statistically significantly higher than the early delayed SSG group (Chi Square = 4.510; *p* = .034).(Table 10 & 11) These results seem to suggest that patients SSG done within 15 days experienced less infection than patients SSG done after 15 days The findings of hospital stay and infection rates in this study are similar to previous studies [3, 4, 5] and can be recommended as a treatment option for burn wounds at .U.T.H to improve outcomes. The results from this study seem to suggest that there was no difference in the experience of contractures in patients SSG done within 15 days and SSG done after 15 days. There were participants who were lost to follow up and therefore the occurrence of contractures could not be conclusively determined this may explain the results obtained in the groups, therefore adequate follow up is necessary to define differences in contracture formation.

To assess the differences in presence of contractures in burns of patients, who receive an early-delayed skin graft and those who do not a Chi Square test was performed to evaluate whether there were any differences in patients experience of contractures between patients who received early-delayed skin graft and those who did not (i.e. based on whether patients were treated within 15 days or after 15 of presentation at the hospital). This test was conducted at significance levels of 0.05. The results indicated that experience of contractures in the late or non SSG group was not statistically significantly higher than the early delayed SSG group (Chi square = 0.999; *p* = .0.258). (Table 12 &13)These results seem to suggest that there was no difference in the experience of contractures in patients SSG done within 15 days and patients SSG done after 15 days. There were participants

who were lost to follow up and therefore the occurrence of contractures could not be determined this may have influenced the results obtained.

9.0 CONCLUSION

Early–delayed split skin graft was found to statistically significantly reduce length of stay and occurence of infection as opposed to late or non ssg.No statistically significant relation could be established for occurence of contractures due to loss in follow up of patient valuable information was lost.This study shows that even if early delayed SSG were to be offered at UTH there is need to carry out awareness campaigns to change peoples attitudes towards the surgical procedure (SSG). This is an approved treatment world-wide which has not gained wide acceptance amongst patients presenting to U.T.H that participated in this study. Patient attitudes and perceptions need to be changed as SSG currently is not seen as a curative treatment but as added injury to an already injured patient.This study showed that SSG is possible and the few patients who underwent early grafting showed good outcomes, shorter hospital stay and lower infection rates. Reduction in contracture formation may have been determined if follow up was achieved.

9.0 STUDY LIMITATIONS

Patients/parents/guardians declining to have an split skin graft performed when all other factors were appropriate such as duration within 2 weeks of burn, wound free of infection and theatre available.Consent obtained after > 3 weeks post burn when it was noted that the wounds were not healing, but by that time contractures would still form even when the graft had a 90% take.This also affected the failure to reach the targeted sample size for patients grafted within 15 days.

The study focussed on only patients with deep partial thickness burns that fit the study criteria and does not show the possible benefits are for 3rd degree burns

Lack of theatre time was a problem at UTH during this period for several other surgical procedure and not only in relation to ssg for burn wounds.This was a duration when the main theatre was undergoing renovations. This affected all surgical procedures including split skin grafting for burn wounds.However in this research, this was not reflected as it would have been had patients consented to the procedure. Lack of and shortage of skin graft blades. The study was limited to one centre. Valuable information from other health institutions in other regions in Zambia

10.0 RECOMMENDATIONS

Awareness campaigns to help patients become more aware of the treatment options for burn wounds.This would ensure awareness of the benefits of a split skin graft.

The campaign should also involve preventive measure as most of these burns are preventable domestic injuries that affect vulnerable age group below 5years of age.

The need for a burns centre where early and early delayed SSG can be performed where patients will be grafted within 15 days post burn to ensure shorter hospital stay, lower infections, and less occurence of contractures.

Further research of burns patients to be carried out country wide as this was a study based at the main hospital in the capital city of Zambia. Information to include other regions of Zambia that are even more constrained than the University Teaching Hospital is required to establish what the outcomes of burn wounds are in relation to when an ssg is performed also would the perception towards an early ssg for burn wounds in a rural setting be any different from the urban findings.

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APPENDIX 1 DATA COLLECTION SHEET

(To be filled in by the patient, parents or guardians)

Patient Serial number _____ Date of Admission ___/____/____

I. Age

2. Sex M_____ F_____

3. Date burn sustained

___/_____/_____

4. Source of burn

Water ☐

Porridge ☐

Flames ☐

Chemicals ☐

Other ☐

Specify _____

5. % TBSA and site. (filled in by researcher Lund Browder chart)

_____ %

_____

6. How long after the burn did the patient present to the hospital?

_____ DAYS

7. Any Clinic visit prior to admission to UTH.

YES_____ NO_____

8. If yes, indicate below what medications given at local clinic prior to hospital admission.

_____

9. If any substances applied to burn area prior to admission to UTH indicate below.

_____

(To be filled in by the researcher)

11. Date of operation (SSG) post burn.

_____ Days.

12. Date of discharge ___/_____/_____

13. Duration of hospital Stay

_____ Days

14. Infection Yes _____ No _____

15. If yes specify

_____

16. HIV Positive ☐ **Negative** ☐

17. Date of discharge ___/_____/_____

18. Number of follow up visits to U.T.H as an out patient

_____

19. Any complication experienced (filled in during clinic reviews).

YES_____/ NO_____

20. If question 18 was answered yes specify what complications were experienced.

21. Presence of contracture.

YES_____ NO _____

(Vancouver scar scale to be used)

22. Thickness of scar in MM

23. Mortality

YES_____ NO _____

24. If yes, state date and cause of death _____.

APPENDIX 2 PATIENT INFORMATION SHEET

Skin grafting is a surgical procedure in which skin or a skin substitute is placed on a burn or non-healing wound. The purpose of the skin graft is to replace damaged or missing skin or to provide a temporary wound covering, the aim being to protect the body from fluid loss, aid in temperature regulation and to avoid infections. The skin graft also reduces the risk of the development of contractures and severe scar formation.

Skin grafting plays a major role in the management of burns. For superficial partial thickness burns, skin grafting is generally not required because these burns almost or completely heal with little or no scarring. Deep partial thickness burns and third degree burns show loss of key dermal elements that are critical for normal healing. These burn types will require skin grafting because when left to heal without any intervention they lead to scarring and contracture formation. Contractures limit mobility and normal function of the affected body part.

APPENDIX 3 CONSENT TO PARTICIPATE IN RESEARCH

A. TITLE

A comparative study of early-delayed skin grafting and late or non-grafting of deep partial thickness burns at the University Teaching Hospital.

B. PURPOSE

1. The purpose of this study is to show that early-delayed grafting can be performed at U.T.H.

2. The purpose of this study is to show that grafting burn wounds within 15 days may reduce hospital stay and improve the outcome of the wounds.

3. The purpose of this study is to show that early-delayed grafting of deep partial thickness burns is likely to reduce infection and contractures.

C. CARE, BENEFITS, AND ALTERNATIVES:

By taking part in this study, you will be exposed to potentially beneficial information and treatment. You are free to withdraw from the study at any time for any reason. Withdrawing from the study shall not in any way disadvantage you from seeking medical attention at this institution.

I ……..

Have (read/been read to) the context of the study and fully understand the risks and advantages of participating in the study described above.

Signed…… this…… day of..... 200……..

Witness…… this…… day of..... 200……

NB: If you have any questions not properly answered by the nurse attending to you and you need clarification, please contact Dr. Maimbo Miriam, Department of Surgery, U.T.H., Lusaka.

CONSENT TO PARTICIPATE IN THE EARLY-DELAYED SKIN GRAFTING OF BURN WOUNDS STUDY.

I have been asked to participate in the above research and give my consent freely and willingly by signing this form after reading the patient information sheet:

I understand that:

1. If I do not volunteer, or decide to withdraw from the study, my decision will be accepted and this will not influence the continuing management of my condition.
2. I have read (or) and understood the information that has been read to me in my vernacular language and have had all my questions answered to my satisfaction.
3. I am further aware that information I divulge will be treated in a confidential manner and I will not be personally identified.

_____	_____
Signature or thumb print of patient.	Signature of Investigator.
_____	_____
Date	Place

N.B.: In case of any questions, please contact me Dr. Miriam Maimbo. Department of Surgery, University Teaching Hospital (UTH), Lusaka.

CONSENT TO ALLOW PATIENT'S BURNS MANAGEMENT TO BE MONITORED.

I have been asked to participate in the above research and give my consent freely and willingly by signing this form after reading the patient information sheet:

I understand that:

1. If I do not volunteer, or decide to withdraw from the study, my decision will be accepted and this will not influence the continuing management of my condition.
2. I have read (or) and understood the information that has been read to me in my vernacular language and have had all my questions answered to my satisfaction.
3. I am further aware that information I divulge will be treated in a confidential manner and I will not be personally identified.
4. I give full permission to the researcher to follow my progress as both an in-patient and outpatient allow for full access to my medical records

_____ _____

Signature or thumb print of patient. Signature of Investigator.

_____ _____

Date Place

N.B.: In case of any questions, please contact me, Dr. Miriam Maimbo. Department of Surgery, University Teaching Hospital (UTH), Lusaka.

APPENDIX 4 PEPALA YA UTHENGA WA MUNTHU ODWALA.

Uthenga Wa Chiyambi.

Tikati “Skin Grafting “ tikutanthauza njila imene imagwilitsidwa nchito pakufuna kuchilitsa chilonda chamoto. Amatenga kadunswa ka khungu ndikuika paja pomwe pali chilonda chamoto. Cholinga chake ndikufuna kukonza pamalo yakhungu yanu yomwe yaonongeka pambuyo pakupysa ndi moto, china chake ndikufuna kuti thupi lanu lisataye madzi ambiri , kuonanso kuti kutentha kwa thupi kukhala kwa bwino ndipo chimathandizanso kuti pamalowo pomwe pali chilonda pakhale pochinjilizidwa kuti pasalowe tidoyo. Njila iyi ya “Skin Grafting” imathandizanso kuti chilonda chanu chisakhale chonoka ndipo musakhale ndi chipysera chachikulu ngati chilonda chapola.

Njira iyi imathandiza kwambiri kuchilitsa zilonda zamoto. Koma zilonda zija zakuti moto sunalowe kwambiri mkati mwa khungu, njila iyi yoika kadunswa kakhungu simagwilitsidwa nchito ai, chifukwa zilonda zotere zimapola zokha ndipo nthawi zina sizimasiya chipsyera. Koma zilonda zija zakuti moto walowa mkati kwambiri mwa khungu ndipo sikotheka kuti chilonda chimenechi chingapole kugwilitsa nchito njila zina. Zilonda zotere zizafunika kuzichilitsa mogwilitsa nchito njila imeneyi yotenga kadunswa ka khungu imene akuti “Skin Grafting” chifukwa chakuti chilonda ichi kuchisiya chabe chimabweretsa bvuto yakukwinyana kwa khungu ndi kukhala ndi zipysera zazikulu. Kukwinyana kwa khungu kupangitsa kuti mbali ya thupi ija imene inali ndi chilonda isiye kumagwila bwino nchito.

Cholinga cha kufufuza

Cholinga cha kufufuza uku ndikufuna kuonetsa kuti pachipatala cha UTH amachilitsa zilonda zamoto kugwilitsa nchito njila iyi ya “Skin Grafting”.

2. Cholinga cha kufufuza uku ndikufuna kuonetsa kuti kuchilitsa zilonda zamoto kugwilitsa nchito njila iyi yotenga kadunswa ka khungu ndikuika pamalo pomwe pali chilonda chamoto mkati mwa masiku 10 kapena 14 chimathandiza kuti musakhale masiku ambiri muchipatala ndipo zilonda zimapola bwino.

3. Cholinga cha kufufuza uku ndikufuna mukafulumira kupita kuchipatala kuti akuchilitseni kugwilitsa nchito njila iyi zilonda zija zakuti moto unalowa mkati kwambiri mwa khungu chimathandiza kwambiri monga kukwinyana kwa khungu.

Zomwe Muyenera Kusatila ndi Phindu lake.

Kutengako mbali munchito iyi yakufufuza sitizakakamiza ndipo ngati mwakana kutengako mbali inu sindiye kuti muzakumana ndi bvuto iliyonse ai. Ngati mwatengako mbali mukufufuza uku inu muzaphunzila zinthu zambiri zomwe zizakuthandizani pazakuchilitsa kwa zilonda zamoto. Ndinu omasuka kusiyila panjila nthawi iliyonse pazifukwa zanu. Ndipo ngati inu mwasiyila panjila kufufuza uku sindiye kuti muzakumana ndi zobvuta zilizonse ai, kapena kuti azayamba kukulesani kupita kuchipatala ai.

Zoopsya Zomwe zingapezeke.

Tiyenera kukambapo kuti zoopsya zomwe zingapezeke ndi monga kuyambula matenda, ndi zimene amati “Heamatoma Formation”. Koma ngakhale zili tere zofunikira zonse pakufuna kupewa mabvuto aya zaikidwa kale m`malo mwake ndipo ndi izi -:

- Nchito iyi iyenera kuchitikila muchipinda cha Theatre m`mene muli zitsulo zonse zofunikira.
- Odwala azalandila mankhwala othandiza kuchinjiliza kuyambula matenda.
- Kadunswa kankhungu kazaikidwa pamalo pomwe pali chilonda chamoto motsimikiza kuti palibe bvuto lilonse lomwe lingalowepo.

Njila Yosamalilamo Zilonda.

Nsalu, ziwiya ndi mankhwala a Jik , zizapatsidwa ku odwala pomwe ali muchipatala kotero kuti azitsukila zilonda zao. Manasi omwe amayanganila odwala azayamba kutsuka zilonda za odwala . Ndi chizatenga nthawi kulingana ndi kukula kwa chilonda , pokhala kuti ngati chilonda ndi chachikulu chimatenga nthawi koma ngati ayikapo kadunswa ka khungu imene akuti “Skin Grafting” odwala atha kutulusidwa muchipatala pambuyo pamasiku 5 kapena 7. Panthawi iyi kukhala kulibe kusintha nsalu zija zomanga pachilonda pokhala kuti iyi ndiyo nthawi yololedwa.

Pambuyo pake aja oyanganila odwala uyu azaphunzitsidwa mosamalila chilonda chija . Panthawi iyi zilonda zaikidwa kale khungu lina pamwamba tere aliyense woyanganila odwala uyu atha kukwanitsa kutsuka chilonda, malinga ngati aphunzitsidwa. Pambuyo pakutuluka muchipatala odwala azapatsidwa miyezi sikisi yopita kuchipatala kukaona

m`mene chilonda chiliri ndipo odwala azafunsidwa kupita kuchipatala katatu kapena kupitapo.

Kupita Kukalandila Uphungu ndikupimisa Mwakufuna kwanu.

Kufufuza uku kulinso ndi mbali ina imene ipeleka mpata ku odwala kuti apimise ndi kulandila uphungu mwakufuna kwao kopanda kukakamiza. Cholinga choyikilako mbali iyi ndikufuna kuti odwala akulandila chitangato chokwana osati chabe kuyangana pabvuto ya zilonda lokha. Apa chitanthauza kuti ngati pambuyo pakupimidwa munthu wapezeka kuti ali ndi kadoyo mthupi mwake, azapitiliza kumupima ndipo azalandila mankhwala ya ma Anti-retroviral kulingana ndi ndondomeko yabungwe ya WHO.

Wofufuza.

Kufufuza uku kuzachitidwa ndi a Dr Mirriam Maimbo aku Department of Surgery, pachipatala cha UTH muno mu Lusaka.

NB: Ngati muli ndi funso imene anasi sanayankhe bwino ndipo mukufuna kumvetsa , chonde gwilitsani nchito makeyala aya:

APPENDIX 5 KUVOMEKEZA KUTENGAKO MBALI MUKUFUFUZA.

(Pepala ya Uthenga Wonse Yalumikizidwa)

A. MUTU.

Kufufuza pofuna kuyelekeza pa kupita mofulumira kukachilitsidwa chilonda cha moto kugwilitsa nchito njila yoika kadunswa ka khungu pachilonda, kapena kuchedwa kupita kapenanso osapitako konse, pomwe muli ndi zilonda zija zakuti munapsya ndipo moto unalowa kwambiri mkati munyama yathupi yanu pa chipatala cha UTH .

B. CHOLINGA.

1. Cholinga chakufufuza uku ndikufuna kuonesa kuti pachipatala cha UTH amachilitsa zilonda zamoto mukafulumira mogwilitsa nchito yoikapo kadunswa kankhungu pachilonda cha moto imene akuti “Skin Grafting”.

2. Cholinga chakufufuza uku ndikufuna kuonesa kuti ngati mwayamba kulandila chithandizo mukati mwa masiku 10 kapena 14 ichi chizathandiza kuchepesako masiku yomwe muzakhala muchipatala ndipo chilonda chanu chizapola bwino.

3. Cholinga chakufufuza uku ndikufuna kuonesa kuti mukapita mofulumira kukalandila chithandizo cha njila yochilitsilamo yoika kadunswa ka khungu pachilonda chanu chimathandiza kuti chilonda chanu chipole bwino ndipo muzapewa bvuto lina lililonse lomwe lingaze pathupi panu pambuyo pakupola.

C. KUSAMALIRA, PHINDU NDI NJILA ZINA:

Mukatengako mbali mukufufuza uku, muzaphunzila zinthu zambiri. Ndipo ndinu omasuka kusiya kutengako mbali panjila nthawi iliyonse pazifukwa zanu. Mukasiya kutengako mbali mukufufuza uku sichitanthauza kuti inu tsopano azakulesani kumapita kuchipatala kukalandila thandizo iliyonse.

Ine……..

Nawerenga bwino ndipo nadziwa zonse zomwe zili mukutengako mbali mukufufuza uku.

Sainani……Lero pa……..Tsiku la……200……

Mboni……..Lero pa……Tsiku la……200……

KUVOMEKEZA KUTENGAKO MBALI MUNCHITO YOFUFUZA PA ZAKUCHILITSA ZILONDA KUGWILITSA NCHITO NJILA YOIKA KADUNSWA KA KHUNGU PA CHILONDA CHA MOTO.

Nafunsidwa kutengako mbali mukufufuza uku kumene kwafotokozedwa pamwambapa ndipo navomera kopanda kukakamizidwa ndipo nasaina pambuyo pakuwerenga bwino uthenga wonse umene uli pa pepala ya uthenga wa munthu odwala:

Ndipo ndikumvetsa kuti:

1. Ngati sindinavomere, kapena naganiza zolekera pa njila sazandiletsa ndipo nizapitiliza kulandilako thandizo yakudwa kwanga .
2. Nawerenga (kapena) namva zimene andiwerengera muchilankhulo change ndipo mafunso yanga yonse yayankhidwa bwino.
3. Ndipo namva kuti uthenga uliwonse umene ndizapeleka ndi waine nekha uzakhala
4. wachisinsi ndipo sazalengeza dzina langa.

Sainani kapena fwatikani Kusaina Kwa Wofufza

Tsiku: …….. Malo:……..

NB: Ngati kuli mafunso yaliyonse , chonde kambilanani ndi a Dr. Miriam Maimbo, Department of Surgery, University Teaching Hospital (UTH),Lusaka.

KUVOMEKEZA KUTI ODWALA ZILONDA ZAKE ZIZIONEWA.

Nafunsidwa kutengako mbali mukufufuza kumene kwafotokozedwa pamwambapa ndipo navomera kopanda kukakamizidwa mosaina chikalata ichi pambuyo pakuwerenga bwino Pepala ya uthenga wa odwala:

Ndipo ndikudziwa kuti:

1. Ngati sindidzavomera kutengako mbali, kapena nizasiyila panjila, azanivomekeza kusiya, ndipo nizapitiliza kupita kuchipatala kukalandila chithandizo.
2. Nawerenga ndipo namva (kapena) namva zimene aniwerengerako muchilankhulo changa ndipo nakhutila ndi m`mene ayankhila mafunso anga.
3. Ndipo ndikudziwa kuti uthenga uliwonse umene nizapeleka ine, uzakhala wachisinsi ndipo sazalengeza dzina langa.
4. Ndipo ndikuvomkeza kutengako mbali mukufufuza uku ndikusatila m`mene ndikupezera ngati odwala ochokera kunyumba kapena odwala amene aali muchipatala ndipo ndizalandila chithandizo chamankhwala mofikapo ndikudziwa zotulukamo zonse.

Sainani kapena fwatikani inu odwala. Sainani inu ofufuza.

Tsiku:..... Malo:.....

NB: Ngati pali zina zimene mungafune kufunsa, chonde kambilanani ndi a Dr. Miriam Maimbo, Department of Surgery, University Teaching Hospital(UTH), Lusaka.

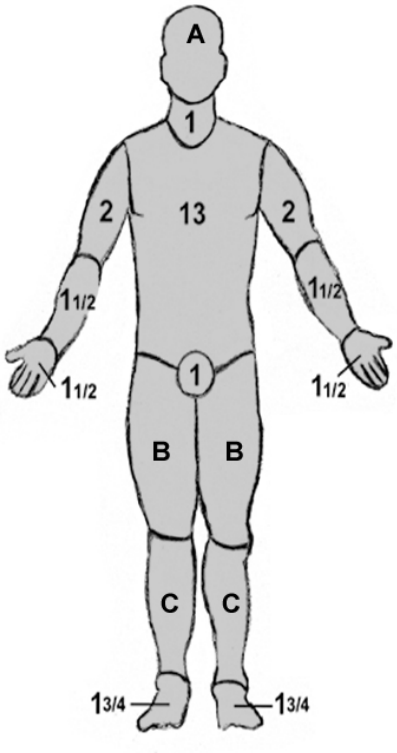
APPENDIX 6 CLASSIFICATION OF BURNS

FIRST DEGREE BURNS	Constitutes minor epithelial damage to the epidermis. Redness Tenderness Pain Sunburn
SECOND DEGREE BURNS	Involve epidermis and dermis.
Superficial partial thickness	Involve epidermis and papillary dermis Skin appendages viable Pink Moist Tender Heal with minimal scarring due to outgrowths of epithelial buds from viable appendages
Deep partial thickness	Burn extends to reticular dermis. Dark red or yellow mottled colour Slow capillary refill Blisters
THIRD DEGREE BURNS	Full thickness Involve epidermis and dermis Appears white or charred Complete loss of capillary bed and nerve endings.
FOURTH DEGREE BURNS	Full thickness destruction of skin and subcutaneous tissue with involvement of fascia, muscle, bone and other structures

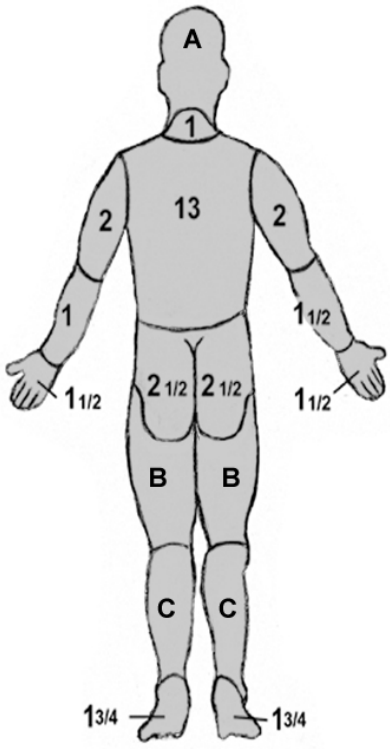
APPENDIX 7 LUND AND BROWDER CHARTS

% Total body surface area burn

Be clear and accurate, and do not include erythema.



	%	
Region	PTL	FTL
Head		
Neck		
Ant. trunk		
Post. trunk		
Right arm		
Left arm		
Buttocks		
Genitalia		
Right leg		
Left leg		
Total burn		



AREA	Age 0	1	5	10	15	Adult
A = 1/2 of head	9 1/2	8 1/2	6 1/2	5 1/2	4 1/2	3 1/2
B = 1/2 of one thigh	2 3/4	3 1/4	4	4 1/2	4 1/2	4 3/4
C = 1/2 of one Lower leg	2 1/2	2 1/2	2 3/4	3	3 1/4	3 1/2