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A COMPARATIVE STUDY OF EFFECTIVENESS OF NEGATIVE PRESSURE WOUND THERAPY (NPWT) VERSUS STANDARD CHLORHEXIDINE GAUZE DRESSING IN THE MANAGEMENT OF POST TRAUMATIC SOFT TISSUE DEFECTS IN THE EXTREMITIES- ONE YEAR HOSPITAL BASED RANDOMIZED CLINICAL TRAIL.

Orthopaedics

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ABSTRACT

Soft tissue defects are more commonly seen in the extremities following high velocity trauma & occupational injuries posing countless challenges in their management. Early flaps or skin grafts reduce the chance of infections in the soft tissue defects. Both are done after thorough surgical debridement. In some cases wound related and patient related factors won't allow early coverage of these defects. During which, one has to consider alternative methods of managing the soft tissue defects in the primary set up. One of the available modality for managing soft tissue defects in the initial periods is Negative Pressure Wound Therapy. This has been found to have a vast benefit over conventional dressings like tulle grass and others. This present study has been conducted as a randomized clinical trail in our hospital which is a tertiary care centre, to evaluate the efficacy of Negative Pressure Wound Therapy (NPWT)(Group A) in the management of post traumatic soft tissue defects in the extremities over the conventional method of managing the wounds with chlorhexidine dressing(Group B) Our aim is to clinically compare, bed of the wound - in terms of formation of healthy granulation tissue, absence of slough, wound retraction before and after intervention in both the groups, which is then followed by skin grafting. **Conclusion:** We conclude that rate of formation of healthy red granulation tissue was faster, slough was reduced rapidly and mean surface area of the wound is reduced significantly in the Negative Pressure Wound Therapy, making it a superior option in the management of patients with post traumatic soft tissue defects in the extremities.

KEYWORDS

Post Traumatic Soft Tissue Defect, Negative Pressure Wound Therapy, Chlorhexidine Gauze Dressing, Healthy Red Granulation Tissue.

INTRODUCTION:

Soft tissue defects are more commonly seen in the extremities following high velocity trauma and occupational injuries. Traumatic soft-tissue defects are not superficial but involve multi-structural tissue damage or loss of tissue when extremities are affected and rarely involve only the skin and the subcutaneous tissue.[1] Various individual and institutional epidemiological studies report the incidence of open fractures to be 11.5 per 100,000 individuals, with an estimated 3.3% of all upper limb and 3.7% of all lower limb and 0.3% of limb girdle, fractures being open. Tibial fractures are open upto 21%, mainly because the soft tissue envelope is thinner when compared to other long bones.[2]

Modern advances and super specialties in surgical disciplines can deal with these injuries in a combined and sophisticated manner. Secondary infection of the wound is a significant complication and will lead to complex complications which pose challenges in the line of treatment in the form of increased hospital stay, partial or complete failure of treatment, exposed implants and deep structures like tendons, nerves, and bone.[3,4] Surgical options to reduce the chances of infection of the wounds include early coverage of wound in the form of flaps or skin grafts. These surgical choices are made after thorough debridement.

However, some wound related and patient related factors do not permit early coverage of these wounds. In these cases one has to consider alternative methods of managing the soft tissue defects in the primary set up. One of the available modality for managing soft tissue defects in the initial periods is Negative Pressure Wound Therapy. This has been found to have a vast benefit over conventional dressings like tulle grass and others.

Negative-pressure wound therapy (NPWT) was initially described as cupping in 1500 BC.[5] It was named in 1952 as Negative-pressure wound therapy. The modern NPWT equipment came into existence in the 1990's with the use of polyurethane foam and a mechanical vacuum designed by Drs. Louis Argenta and Michael Morykwas of Wake Forest University School of Medicine.[6] This mechanically induce negative pressure removes fluid from the extravascular space, improves circulation in oedematous tissue by lowering capillary afterload and enhances the proliferation of reparative granulation tissue and aids in wound contraction and continues to be advantageous, meritorious in the process of healing of complex wounds and preventing the complications thus decreasing the hospital stay and improving compliance.

In 1950s Chlorhexidine was discovered by the Imperial Chemical Industries, Limited (Manchester, UK) while researching the synthesis of anti-malarial agents.[7,8] Bactigras consists of a gauze fabric impregnated with yellow soft paraffin containing 0.5% chlorhexidine acetate, a potent antimicrobial agent which is active against a wide range of microorganisms. It is strongly bound to cellulose materials, such as cotton or viscose and its antimicrobial activity is reduced in the presence of the blood and pus. Clinical experience with bactigras suggested that the dressing may be of some value in the treatment of non-infected minor burns as a prophylactic agent against the growth of bacteria.

The present study has been conducted in our hospital which is a tertiary care centre, to evaluate the efficacy of negative pressure wound therapy (NPWT) in the management of soft tissue defects in the extremities over the conventional method of managing the wounds with chlorhexidine dressing.

METHODOLOGY:

Source Of Data:

Patients with post traumatic raw wounds without exposed bones, cartilages or other vital structures admitted to the department of orthopaedics or plastic surgery at the KLE'S Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi, between 1st January 2022 and 31st December 2022, over a period of one year.

Materials Used For Dressings:

DEBRIDEMENT INSTRUMENTS SET

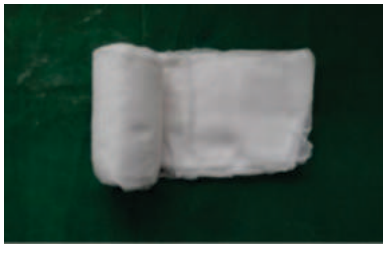
CHLORHEXIDINE GAUZE

ADHESIVE DRAPE – OPSITE

WALL MOUNT SUCTION APPARATUS

SPONGE

VACCU SUCK No. 16 SUCTION CATHETER CREPE BANDAGE



GAMJEE

Method Of Collection Of Data:

Study Design: A hospital based one year randomized clinical trial study.

Sample Size: 40 cases randomly distributed into two groups of 20 each.

Sampling Method: random computerized allocation (Random allocation software, version 1.0, may 2004)

Study Groups:

GROUP A: Patients undergoing Negative Pressure Wound Therapy (NPWT).

GROUP B: Patients undergoing standard dressing with chlorhexidine gauze.

Inclusion Criteria:

- Post traumatic wounds of thigh, leg, ankle, foot, arm, fore arm and hand
- Age: 18 years and above

Exclusion Criteria:

- Exposed bare bones, cartilages or other vital structures (blood vessels, anastomotic sites, organs or nerves)
- Chronic wounds, post surgical, dehisced wounds, diabetic and neuropathic ulcers
- Patients with bleeding disorder or on anticoagulant

Procedure:

NEGATIVE PRESSURE WOUND THERAPY (NPWT):

- A culture swab for microbiology was taken before wound irrigation with normal saline. Then wound is irrigated with normal saline, necrotic tissues are surgically removed (debridement) and adequate haemostasis is achieved.
- Prior to application of drape, the periwound skin is made dry, followed by placing sterile foam or sponge into the wound cavity and sealing with adhesive drapes in such a way that it covers sponge & tubing and at least 2-5 cm of surrounding healthy granulation tissue to ensure a seal.
- A controlled uniform pressure is applied to all tissues on the inner surface of the wound; the pump delivers a negative pressure of 70 mmHg.
- Negative pressure is applied in cycles of 50 minutes with 10 minutes of stopage.
- The dressing is changed on the 5th day to examine the wound for granulation.
- If not satisfactory, it is continued for two more settings.

STANDARD CHLORHEXIDINE GAUZE DRESSING:

- A culture swab for microbiology was taken before wound irrigation with normal saline. Then wound is irrigated with normal saline followed by debridement and achievement of adequate haemostasis and then application of chlorhexidine gauze dressing.
- Daily dressing by conventional methods, that is, culture swab for microbiology was taken followed by cleaning with hydrogen peroxide and normal saline and dressing the wound with povidone iodine (5%) and chlorhexidine gauze.
- Wound examined daily for healthy granulation.
- Dressing continued for maximum of 15 days.

OBSERVATIONS:

Our RCT study consisted of 40 post traumatic soft tissue defects treated with NPWT or chlorhexidine gauze dressing. Wounds were observed on 5th day and/ or 10th day and/ or 15th day for healthy red granulation tissue, absence of slough and measured wound contractures.

Mechanism of injury:

The causes of soft tissue defects were road traffic accident in twenty one patients and occupational (industrial and agricultural) in remaining nineteen patients.

Co- morbidities or associated injuries:

Fourteen patients had associated injuries/ co-morbidities. Twelve patients had fracture, one patient had fracture along with hypertension while another patient had hypertension at the time of admission. All associated injuries/ co-morbidities were treated at the same timing

accordingly.

Assessment:
At each dressing change, the wound was carefully assessed to determine if the wound was healthy, slough free and amount wound contraction by noting various parameters as mentioned in Wound Observations.

If unhealthy granulation tissue or slough was surfaced in the wound, culture swab for microbiology was taken and additional surgical debridement was performed, before a new dressing could be applied.The area of the wound was assessed on Day 0, Day 5, Day 10 and Day 15 as required and percentage of reduction was calculated.

RESULTS:

Table 1 . Floor Of The Wound – Group A And Group B

GROUP A				
	DAY 0	DAY 5	DAY 10	DAY 15
HEALTHY RED GRANULATION TISSUE	0	17	5	1
UNHEALTHY PALE YELLOW GRANULATION TISSUE	20	3	0	0
NA	0	0	15	19
TOTAL	20	20	20	20

GROUP B

	DAY 0	DAY 5	DAY 10	DAY 15
HEALTHY RED GRANULATION TISSUE	0	5	13	2
UNHEALTHY PALE YELLOW GRANULATION TISSUE	20	15	2	0
NA	0	0	5	18
TOTAL	20	20	20	20

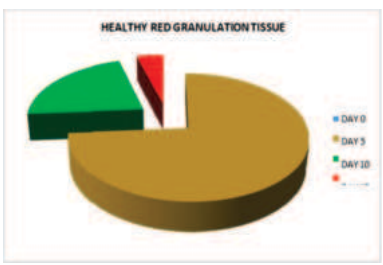
P<0.0001 (HS) – chi-square test

Tables shows that patients treated in group A developed healthy red granulation tissue faster compared to patients treated in group B.

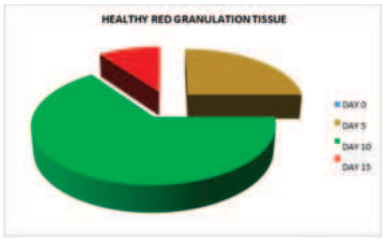
In the present study all forty patients were having unhealthy pale yellow granulation tissue at day 0. At day 5, seventeen out of twenty patients were having healthy red granulation tissue in group A compared to five out of twenty patients in group B. At day 10, the remaining three patients were having healthy red granulation tissue in group A and thirteen out of fifteen remaining patients were having healthy red granulation tissue in group B. At day 15, remaining two patients were having healthy red granulation tissue in group B with p value less than 0.0001 (using chi square test) and this difference was considered to be extremely statistically significant.

However, in group A two patients continued treatment for one more sitting even after appearance of healthy red granulation tissue at day 5 because, one patient was having non adherent yellow slough which became slough free at day 10 and other patient was having larger area of soft tissue defect which reduced further more at day10 thereby requiring smaller sized skin grafting of the wound and one patient continued treatment for one more sitting even after appearance of healthy red granulation tissue at day 10 as, there was extensive soft tissue loss which took three sittings to fill up the defect which later covered with skin graft.

PIECHART 1: OMPARSION OF NUMBER OF PATIENTS DEVELOPING HEALTHY GRANULATION TISSUE OF WOUNDS AT DIFFERENT DAYS BETWEEN GROUP A and GROUP B



Group A



GROUP B

Table 2. Slough/ Necrotic Tissue:

	DAY 0			
	GROUP A		GROUP B	
	NUMBER	PERCENTAGE	NUMBER	PERCENTAGE
Absent	6	30.00	13	65.00
White/grey non viable	9	45.00	6	30.00
Non attached yellow	5	25.00	0	0.00
Loosely attached yellow	0	0.00	1	5.00
TOTAL	20	100.00	20	100.00
	DAY 5			
	GROUP A		GROUP B	
	NUMBER	PERCENTAGE	NUMBER	PERCENTAGE
Absent	16	80.00	17	85.00
White/grey non viable	0	0.00	0	0.00
Non attached yellow	4	20.00	3	15.00
Loosely attached yellow	0	0.00	0	0.00
TOTAL	20	100.00	20	100.00
	DAY 10			
	GROUP A		GROUP B	
	NUMBER	PERCENTAGE	NUMBER	PERCENTAGE
Absent	5	25.00	15	75.00
White/grey non viable	0	0.00	0	0.00
NA	15	75.00	5	25.00
TOTAL	20	100.00	20	100.00
	DAY 15			
	GROUP A		GROUP B	
	NUMBER	PERCENTAGE	NUMBER	PERCENTAGE
Absent	1	5.00	2	10.00
White/grey non viable	0	0.00	0	0.00
NA	19	95.00	18	90.00
TOTAL	20	100.00	20	100.00

P <0.0001 (HS) – chi-square test Tables shows that patients treated in group A get rid of slough faster compared to patients treated in group B. In the present study, six out of twenty patients in group A were having slough free wounds compared to thirteen out of twenty patients in group B at day 0. At day 5, ten out of fourteen remaining patients in group A were having slough free wounds compared to four out of seven remaining patients in group B. At day 10, remaining four patients and three patients were having slough free wounds in group A and group B respectively with p value less than 0.0001 (using chi square test) and this difference was considered to be extremely statistically significant. Even though, six patients in group A and three patients in group B were having slough free wounds at day 0 were continued treatment for one

more sitting as they were having unhealthy pale yellow granulation tissue and larger area of soft tissue loss and remaining ten patients in group B which were also having slough free wounds at day 0 were continued treatment for two more sittings as they were having unhealthy pale yellow granulation tissue. one patient in group A was having slough free wound at day 5 but, continued treatment for one more sitting as patient was having larger area of soft tissue defect which reduced further more at day 10 helping in smaller sized skin grafting of the wound and two patients in group B were having slough free wound at day 5 but, continued treatment for one more sitting as they were having unhealthy pale yellow granulation tissue. One patient in group A was having slough free wound at day 10 but, continued treatment for one more sitting as patient was having deeper soft tissue defect which filled up completely by day 15 and two patients in group B were having slough free wounds at day 10 but, continued treatment for one more sitting as they were having unhealthy pale yellow granulation tissue.

Table 3. Percentage Reduction In Area Of The Wound (sq.cm)

	GROUP A		GROUP B			
DAYS	n/ MEAN	SD	n/ MEAN	SD	P value	INFEENCE
DAY 5	20/ 23.47	5.86	20/ 5.79	3.76	<0.0001	HS
DAY 10	5/ 38.43	9.56	15/ 9.08	1.99	<0.0001	HS
DAY 15	1/ NA	NA	2/8.30	3.08	NA	NA

P<0.0001 (HS) - student's unpaired t test

Table shows that, the surface area of wounds in group A was reduced more effectively than in group B.

In the present study average reduction of wound area of twenty patients in group A was 23.47% compared to 5.79% in group B at day 5 with p value less than 0.0001 (using student's unpaired t test) and this difference was considered to be extremely statistically significant. Average reduction of wound area of five patients in group A was 38.43% and average reduction of wound area of fifteen patients in group B was 9.08% at day 10 with P value less than 0.0001 (using student's unpaired t test) and this difference was considered to be extremely statistically significant. Reduction of wound area of one patient in group A was 52% and average reduction of wound area of two patients in group B was 8.30% at day 15 and p value can't be calculated as there was only one patient in group A.

Overall average reduction of wound area of all twenty patients at the end of the treatment was 28.49% (from 81.3375 sq.cm to 58.719 sq.cm) in group A compared to 9.90% (from 52.8865 sq.cm to 47.71 sq.cm) in group B with p value less than 0.0001 (using student's unpaired t test) and this difference was considered to be extremely statistically significant.Even though, in group A four patients with satisfactory reduction in the wound area was achieved on day 5, they continued treatment for one more sitting in which one patient continued treatment as the patient was having larger area of soft tissue defect which reduced further more on day 10 helping in smaller sized skin grafting of the wound. Two patients continued treatment as they were having unhealthy pale yellow granulation tissue & slough and one patient continued due to presence of slough. One patient continued treatment for one more sitting at day 10, even after having healthy red granulation tissue and slough free wound because patient was having deeper soft tissue defect which filled up completely at day 15.

In group B, at day 5 thirteen patients continued treatment for one more sitting of which twelve patients were having unhealthy pale yellow granulation tissue & reduction of wound area was not satisfactory and one patient was having unhealthy pale yellow granulation tissue, slough and reduction of wound area was also not satisfactory. At day 10 two patients continued treatment for one more sitting as they were having unhealthy pale yellow granulation tissue and reduction of wound area was also not satisfactory.

Table 3 . Number Of Days Patient Underwent Treatment

	DAY 5	DAY 10	DAY 15	TOTAL
GROUP A	15	4	1	20
GROUP B	5	13	2	20
TOTAL	20	17	3	40

P = 0.0064 (VS) – chi-square test

Table shows that, patients treated in group A completed treatment earlier than in group B.In the present study fifteen patients (75%) completed treatment at day 5 in group A compared to five patients (25%) in group B. Four patients (20%) completed treatment at day 10 in group A compared to thirteen patients (65%) in group B. One patient (5%) completed treatment at day 15 in group A compared to two patients (10%) in group B with p value of 0.0064 (using chi square test) and this difference was considered to be highly statistically significant.

DISCUSSION:

Post traumatic soft tissue defects of the extremities pose countless challenges in their management. Early flaps or skin grafts reduce the chance of infections in such defects. Both are done after thorough surgical debridement. In certain cases wound related and patient related factors do not allow early coverage of these defects. During these, one has to consider alternative methods of managing the soft tissue defects in the primary set up. One of the available modality for managing soft tissue defects in the initial periods is Negative Pressure Wound Therapy. This has been found to have a vast benefit over conventional dressings like tulle grass and others.

In the present study, total of 40 patients were included and were randomly distributed into two study groups of twenty each. One group underwent NPWT and other group underwent standard dressing with chlorhexidine gauze. We compared clinically, bed of the wound - in terms of formation of healthy granulation tissue, absence of slough, wound retraction after intervention between negative pressure wound therapy (NPWT) and standard chlorhexidine gauze dressing in post traumatic soft tissue defects in the extremities.

For a wound to be said “ready for surgical therapy”, base should be having of red healthy granulation tissue and slough free.

NPWT has been proven to stimulate local angiogenesis, thereby increasing blood flow. The result is enhanced granulation tissue formation. The local increase in vascularity results in an influx of fibroblasts, which diminish the surface area of the wound by approximating its margins. Intermittent suction is associated with greater stimulation of granulation tissue formation [8]

FLOOR:

In the present study all forty patients were having unhealthy pale yellow granulation tissue at day 0. At day 5, seventeen out of twenty patients were having healthy red granulation tissue in NPWT Group compared to five out of twenty patients in chlorhexidine gauze dressing Group. At day 10, the remaining three patients were having healthy red granulation tissue in NPWT Group and thirteen out of fifteen remaining patients were having healthy red granulation tissue in chlorhexidine gauze dressing Group. At day 15, remaining two patients were having healthy red granulation tissue in chlorhexidine gauze dressing Group with p value less than 0.0001 (using chi square test) and this difference was considered to be extremely statistically significant.

In a study conducted on 30 patients by Prabhdeep Singh Nain et al., it was observed that during the first week granulation tissue was absent in 4 patients (26.67%) in Group A (NPWT) and 10 patients (66.67%) in Group B (saline- moistened gauze). It was found that granulation tissue appeared at 2nd week in three out of four patients (75%) and 4th week in the remaining (25%) patient in Group A. The appearance of granulation tissue in patients of Group B was at 2nd, 4th and 5th week in three (30%), 3(30%) and two (20%) patients, respectively. At the end of observation period, it was also found that in two (20%) patients granulation tissue remained absent. This suggested early appearance of granulation tissue in patients of Group A which was also found to be statistically significant.[9]

In another study conducted on 54 patients by C.M. Moue □s et. al it was found that in the vacuum-treated Group, 20 patients (69%) showed a healthy, granulating wound bed within 1 week compared to 14 (56%) in the conventionally treated Group.

Within the next week, five more patients in the vacuum Group showed a clean, healthy wound bed (cumulative 86%) compared to seven in the conventionally treated Group (84%). In one vacuum-treated patient (3%) wound healing was slow and duration of therapy exceeded 14 days compared to three patients in the conventional Group (12%). Based on the visual aspects along with the formation of granulating tissue, healthier wound conditions were observed earlier in the vacuum

Group compared to wounds in conventionally treated Group.[10]

In a 3rd study conducted on 162 patients by Armstrong DG, Lavery LA, the rate of granulation tissue formation, based on the time to 76-100% formation in the wound bed, was faster in the NPWT Group than in controls (p=0.002).[11]

In our study also it was found that rate of formation of healthy red granulation tissue was faster in the patients of NPWT Group as compared to chlorhexidine gauze dressing Group indicating that NPWT is superior in development of red healthy granulation tissue in post traumatic soft tissue defects in the extremities. This supports the finding that NPWT has a positive effect on promotion of granulation tissue which is an sign of improved vascularity.

Slough:

In the present study, six out of twenty patients in NPWT Group were having slough free wounds compared to thirteen out of twenty patients in chlorhexidine gauze dressing Group at day 0. At day 5, ten out of fourteen remaining patients (71.42%) in NPWT Group were having slough free wounds compared to four out of seven remaining patients (57.14%) in chlorhexidine gauze dressing Group. At day 10, remaining four patients and three patients were having slough free wounds in NPWT Group and chlorhexidine gauze dressing Group respectively with p value less than 0.0001 (using chi square test) and this difference was considered to be extremely statistically significant. Reduction in slough indicates reduction in the burden of nonviable tissue which is a prerequisite for planning definitive coverage of the wound.

As per our awareness after complete search through available and updated literature, there are no studies on reduction of slough in the wound bed between NPWT and conventional dressings and our study is the first to demonstrate such a difference between NPWT and conventional dressing.

In our study it was found that patients of NPWT Group showed rapid reduction in slough compared to chlorhexidine gauze dressing Group. This suggests that NPWT also plays a role in improving vascularity of wound and preventing further cell death.

Wound Contracture:

In the present study, overall average reduction of wound area of all twenty patients at the end of the treatment was 28.49% (from 81.3375 sq.cm to 58.719 sq.cm) in NPWT Group compared to 9.90% (from 52.8865 sq.cm to 47.71 sq.cm) in chlorhexidine gauze dressing Group with p value less than 0.0001 (using student's unpaired t test) and this difference was considered to be extremely statistically significant.

In a study conducted on 24 patients by Abdullah Etoz, before treatment, the mean area was 109 sq.cm in the NPWT Group and 94.8 sq.cm in control Group. Following therapy, the mean wound surface area decreased by 20.4 sq.cm (109 sq.cm to 88.6 sq.cm) in the NPWT Group, and decreased by 9.5 sq.cm (94.8 sq.cm to 85.3 sq.cm) in the control Group ($P = 0.032$). The difference in the rate of surface area reduction between the Groups was significant. The surface area of wounds in the NPWT Group was reduced more effectively than control Group wounds ($p < 0.05$).[12]

Table 4. Study Comparison Of Wound Contracture

	Study by Abdullah Etoz		PRESENT STUDY	
AREA OF AN ULCER (MEAN)	NPWT Group	Control Group	NPWT Group	Control Group
BEFORE	109 sq.cm	94.80 sq.cm	81.33 sq.cm	52.88 sq.cm
AFTER	80.6 sq.cm	85.30 sq.cm	58.71 sq.cm	47.71 sq.cm

In another study conducted on 30 patients by Prabhdeep Singh Nain et. Al, the percentage decrease in the wound size was more in patients of Group A (NPWT) as compared to Group B (saline-moistened gauze). The mean decrease in the wound size in patients of Group A was -16.14±13.04 sq.cm and that of Group B was -5.98±14.41 sq.cm. This difference was found to be statistically significant ($p<0.05$).[9]

In a 3rd study conducted on 10 patients by Isago T et.al, where the efficacy of topical negative pressure moist dressings was assessed, in pressure ulcers, by comparing the mean rate of reduction of ulcer area and depth before and after application of the dressing. The mean reduction in ulcer depth and surface area were 61.2% and 55.1% respectively. This study clearly shows the efficacy of topical negative pressure dressings in the management of pressure ulcers which are usually resistant to healing by conventional types of wound dressings.[13]

In our study also it was found that the percentage decrease in the wound surface area was more in patients of NPWT Group as compared to chlorhexidine gauze dressing Group indicating NPWT is superior in wound contraction in post traumatic soft tissue defects in the extremities.

In our study, fifteen patients (75%) completed treatment at day 5 in group A compared to five patients (25%) in group B. Four patients (20%) completed treatment at day 10 in group A compared to thirteen patients (65%) in group B. One patient (5%) completed treatment at day 15 in group A compared to two patients (10%) in group B with p value of 0.0064 (using chi square test) and this difference was considered to be highly statistically significant indicating NPWT is superior in the managemet of post traumatic soft tissue in the extremities and also reduced the hospital stay of patients, reduced dressing changes, reduced nursing time with better patient tolerence, improved patient's quality life and reduced overall cost burden for the patients.

Of the 40 patients, some patients underwent STSG and few underwent Flap coverage while one patient underwent both STSG & flap coverage as a final treatment modality. One patient's wound healed spontaneously.

CONCLUSION :

In our study, rate of formation of healthy red granulation tissue and overall reduction in slough was faster in the patients of NPWT group as compared to chlorhexidine gauze dressing group. Average percentage reduction in the mean surface area of the wound was significantly more in the NPWT group as in comparison to the chlorhexidine gauze dressing group.

Thus we conclude that the rate of formation of healthy red granulation tissue was faster, slough was reduced rapidly and mean surface area of the wound was reduced significantly in the Negative Pressure Wound Therapy, making Negative Pressure Wound Therapy a superior option in the management of patients with post traumatic soft tissue defects in the extremities.

However, further studies with larger population will be needed in the future before NPWT can be added to the wide spectrum of treatment modalities available in the management of post traumatic soft tissue defects and wounds of other aetiology.

Limitations Of The Study:

- In our study it was seen that in the randomized sample 7 patients have fascia as the base and 13 patients have soft tissue as the base in group B. Whereas, in Group A all patients had soft tissue as base. This difference is statistically significant. Hence, we cannot completely say that the samples were homogenous. This is a significant limitation in our study.
- Our study is a single centric study with a sample size of 40. Thus, we suggest multi centric, large sample size studies to support a similar hypothesis.

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