

# Post Operative Outcomes In Relation To Iliac Graft Donor Site With Drain And Without Drain: A Comparitive Study

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**ABSTRACT: Aim: To evaluate post-operative outcomes of anterior iliac bone graft after alveolar bone grafting in cleft patients with and without surgical drain.**

**Methodology: Forty patients with cleft alveolus were randomly selected and divided into two groups. Group 1 consisted of 20 patients (assessment finished drain attached to iliac graft) and Group 2 consisted of 20 patients (assessment steer clear off drain in respect to iliac graft). Evaluation was finished the assistance of questionnaire in terms of pain (with the assistance of visual analogue scale starting from 1-10), gait (through observation), infection and wound healing (through clinical examination) in both the groups. Chi square test was employed to gauge the comparison between various variables.**

**Results: In our study we observed that post-operatively on day 1, patients in both group I and II, mostly were tormented by unbearable pain which was however controlled with high dose IV analgesics. By day 3, pain intensity dropped in patients without drain which was statistically significant ( $p=0.032$ ). In Group I patients, around 54 available around 20-29 ml of fluid collection through the drain on day 1, which led to extreme discomfort for the patients and was statistically significant further ( $p=0.032$ ).**

**Conclusion:** *Closed suction drainage has no effect on wound-healing following the removal of bone from the iliac crest to be used as a graft.*

**Keywords:** *Bone grafting, pain assessment, iliac bone, postoperative complications.*

## 1. INTRODUCTION

Autogenous bone grafting may be a routine procedure for patients having alveolar bone clefts and has been well documented.<sup>1,2</sup> the foremost common graft used for this purpose is Iliac graft.<sup>3</sup> A full-thickness iliac crest bone graft consists of two thick cortices with sufficient amount of cancellous bone in between and might restore the thickness and height of jaw efficiently. The graft shows a decent success rate, and implant insertion is feasible during this variety of bone graft. Mandibular continuity defects treated with free iliac bone grafting are documented with a few 70% success rate. the speed of successful union is decreased significantly where the defect is longer than 6 cm. The posterior iliac crest can also be used as a donor site. Morbidity rate for anterior iliac crest bone grafts is over posterior iliac site (23% and a couple of respectively).<sup>4</sup> Attaching surgical drain to the graft site may be a routine procedure practiced worldwide in several specialties including pediatrics.<sup>5-7</sup> Despite the differences, both schools of thought (attaching drain and not attaching drain) prevail in day today practice. Though few comparative studies finished or without surgical drain in respect to iliac graft site are reviewed within the field of orthopedics, still controversies exist with relevance use of drain. Proponents of drain firmly believe that surgical drains evacuate the buildup of existing fluids and thereby decreases post-operative swelling which improves the standard of patient's life within the immediate post op period, reduces hematoma formation and thereby decreases rate of infection.<sup>8</sup> Besides these, literature recommend the employment of drains for its aesthetic value in reducing the quantity of dressing changes after surgery. Opponents of drain, though they accept the above- argue that the presence of drain may itself contribute to infection and when put next there aren't any statistical difference with respect to pain severity and infection rate. supported literature, the typical amount of drain collection was known to possess a complete amount of 100 ml in 3-4 days and in most of the cases drain was removed in third or fourth post-operative day when it becomes but 10 ml. With appropriate steps taken to manage bleeding (fluid accumulation) intra operatively and with adequate post-operative care - it had been hypothesized that, this amount of fluid collection might not cause post-operative complications like pain, edema, discharge within the grafted site because the body has inherent capacity to soak up a number of the fluids and thus the requirement for surgical drain is questioned. Lack of statistical difference (as stated by opponents) doesn't necessarily translate into lack of clinical or scientific difference and it should be remembered that the responses varies widely between populations.<sup>9</sup> Hence a prospective randomized comparative study was designed to match the post-operative outcomes with relevance iliac graft with and without drain.

## 2. AIM OF THE STUDY

To evaluate post-operative outcomes of anterior iliac bone graft after alveolar bone grafting in cleft patients with and without surgical drain.

## 3. METHODOLOGY

Forty patients with cleft alveolus were randomly selected and divided into two groups. Group 1 consisted of 20 patients (assessment finished drain attached to iliac graft) and Group 2 consisted of 20 patients (assessment eluded drain in relevance iliac graft). Standard surgical steps were employed in both the groups and there was no difference within the surgical treatment (with exception of attachment of drain in Group 1 patients). All patients included for the study were within the age range of 7-12 years. A questionnaire format was designed

during which the subsequent has been documented for both the groups. Basic biometric information (age/sex), Alveolar cleft details unilateral/Bilateral, Right/Left, Complete/incomplete, Iliac graft site- Right/left. An consent (in English and native language) was obtained from the foyeys after explaining the questionnaire to them.<sup>19,20</sup> Evaluation was through with the assistance of questionnaire in terms of pain (with the assistance of visual analogue scale starting from 1-10), gait (through observation), infection and wound healing ( through clinical examination) in both the groups.<sup>1,21-23</sup> Amount of Drain collected and overall experience with drain was noted only in Group 1 patients. Statistical evaluation was dole out using SPSS 25.0 using descriptive statistics including frequency percentage analysis. Chi square test was employed to judge the comparison between various variables

#### 4. RESULTS

In our study we observed that post-operatively on day 1, patients in both group I and II, mostly were suffering from unbearable pain which was however controlled with high dose IV analgesics. The pain intensity improved with 2<sup>nd</sup> day; analgesics were given to most patients. By day 3, pain intensity dropped in patients without drain which was statistically significant ( $p=0.032$ ). At the end of 2 weeks, no pain was observed in both Group I and II. As far as Gait of the study patients was concerned, at day 1; noteworthy mobility was observed in patients without drain, and in case of patients with drain, they needed support and was statistically significant ( $p=0.041$ ), which improved at the end of 2 weeks. (Table 1) There was no significant difference in wound healing or presence of infection as the post- operative site was healthy and there was no evidence of pus/ necrosis. (Table 2) In Group I patients, around 54 % had around 20-29 ml of fluid collection through the drain on day 1, which led to extreme discomfort for the patients and was statistically significant as well ( $p=0.032$ ). By day 5, fluid collection was not recorded in the patients, however 75% of them were satisfied with drain placement, which affected their daily life activities as well. 67% of patients had significant issues with drain placement on day 1 which improved at the end of day 5. (Table 3)

#### 5. DISCUSSION

In our study we observed that post-operatively on day 1, patients in both group I and II, mostly were laid low with unbearable pain which was however controlled with high dose IV analgesics. The pain intensity improved with 2<sup>nd</sup> day; analgesics got to most patients. By day 3, pain intensity dropped in patients without drain which was statistically significant ( $p=0.032$ ). At the top of two weeks, no pain was observed in both Group I and II. As far as Gait of the study patients was concerned, at day 1; noteworthy mobility was observed in patients without drain, and just in case of patients with drain, they needed support and was statistically significant ( $p=0.041$ ), which improved at the top of two weeks. (Table 1) There was no significant difference in wound healing or presence of infection because the post-operative site was healthy and there was no evidence of pus/ necrosis. (Table 2) In Group I patients, around 54 available around 20-29 ml of fluid collection through the drain on day 1, which led to extreme discomfort for the patients and was statistically significant further ( $p=0.032$ ). By day 5, fluid collection wasn't recorded within the patients, however 75% of them were satisfied with drain placement, which affected their standard of living activities additionally. 67% of patients had significant issues with drain placement on day 1 which improved at the tip of day 5. (Table 3)

**Table 1- Pain intensity of the patients with drain (Group I) vs the intensity of pain without drain (Group II).**

	Pain intensity			Gait of patients		
	Score in patients with drain	Score in patients without drain	chi test (p value)	Score in patients with drain	Score in patients without drain	chi test (p value)
<b>Day 1</b>	5 (34%)	5 (31%)	0.68	2 (73%)	4 (78%)	0.041
<b>Day 2</b>	4 (37%)	4 (34%)	0.41	4 (81%)	5 (90%)	0.039
<b>Day 3</b>	2 (40%)	2 (66%)	0.032	5 (90%)	5(100%)	0.0275
<b>Day 4</b>	0 (80%)	0(83%)	0.043	5(100%)	5(100%)	2.67
<b>Day 5</b>	0 (90%)	0(100%)	0.022	5(100%)	5(100%)	2.67
<b>Day 6</b>	0(100%)	0(100%)	1.24	5(100%)	5(100%)	2.67
<b>Day 7</b>	0(100%)	0(100%)	1.24	5(100%)	5(100%)	2.67
<b>2 weeks</b>	0(100%)	0(100%)	1.24	5(100%)	5(100%)	2.67

*\*Pain intensity score (Visual Analogue score)-0- No pain,1 -Mild Pain, 2- Nagging Pain,3-Distressing pain, 4-Intense Pain, 5- Unbearable Pain, Gait score- 1- Cannot walk, 2 and 3- With support (With pressure toe, With pressure heel), 4 Without support (With pressure toe), 5- with pressure heel.*

**Table 2- Wound healing index as well as presence of infection in patients with drain (Group I) vs without drain (Group II).**

Wound healing			Infection rate		
Score in patients with drain	Score in patients without drain	chi test (p value)	Score in patients with drain	Score in patients without drain	chi test (p value)
0 (100%)	0 (100%)	0.00	2 (100%)	2 (100%)	1.37

*\*Wound Healing score- 0- Complete healing, 1- Incomplete but healthy healing, 2- Delayed but healthy healing, 3- Healing not started but healthy environment, 4- Formation of pus /evidence of necrosis. Infection score- 1- Present (Surgical site infection), 2- Absent (Drain site infection)*

**Table 3- Drain collection as well as overall experience with the use of drain in Group I patients with Illiac bone graft**

	Drain fluid collection	Overall experience with drain	chi test (p value)
<b>Day 1</b>	3 (54%)	0 (67%)	0.032
<b>Day 2</b>	2 (65%)	1(78%)	0.04
<b>Day 3</b>	1 (85%)	1(89%)	0.19
<b>Day 4</b>	0 (90%)	2(34%)	0.0211
<b>Day 5</b>	0 (100%)	2(75%)	0.0119

*\*Drain fluid collection amount score-0- no fluid, 1-0-9 ml, 2-10-19 ml, 3-20-29 ml, 4-30-39 ml, 5-40-49 ml, 6-50 and > 50 ml, overall experience score- 0- not at all happy and with complications, 1- discomforting 2- happy.*

## 6. DISCUSSION

In the current study, harvesting from the inner table of the anterior iliac crest provided sufficient quantities of bone for alveolar augmentation for all patients. The benefits of this donor site include easy accessibility, a high ratio of cancellous to cortical bone and a high concentration of osteoblasts, which induce additional bone growth at the recipient site.<sup>10,11</sup> Bone harvest from this site, however, has the disadvantage of the requirement for a separate donor site with its inherent morbidity. The complications of the anterior iliac approach include prolonged post-operative pain,<sup>12-14</sup> altered gait,<sup>15,16</sup> nerve damage,<sup>17</sup> poor scar placement and altered bone contour, delayed healing,<sup>18</sup> herniation of abdominal contents,<sup>19</sup> clicking during walking, ilium fracture,<sup>20</sup> peritonitis,<sup>21</sup> excessive blood loss and barely retroperitoneal haematoma.<sup>22</sup> It is postulated that this can be either muscular or periosteal, secondary to the stripping of abductors from the ilium or neurogenic secondary to nervus injury. So as to beat the matter of pain at the wound site, several technical modifications are suggested<sup>23</sup> and furthermore, the utilization of Bupivacaine for post-operative pain relief.<sup>24</sup> Other modifications include, placement of a vertical or oblique skin incision to avoid cutting cutaneous nerves, incisions greater than or capable 3 cm dorsal to the anterior superior iliac spine and sub-periosteal dissection with careful haemostasis.<sup>25,26</sup> It's been suggested that incisions directly over the crest are avoided as this increases the incidence of delayed healing.<sup>27</sup> However, the utilization of medially and crestally placed incisions also increases the chance of injury to the lateral cutaneous nerve of the thigh. Paraesthesia of the anterior thigh also occurs when the lateral femoral cutaneous nerve is injured. Gait disturbance after bone harvesting from the inner table could be a minimal and temporary inconvenience.<sup>28</sup> Donor site deformity is minimised by repositioning of the osteoplastic flap and suturing with a powerful resorbable suture.<sup>29</sup> Haematoma formation results from inadequate intra-operative haemostasis, improper sub-periosteal dissection or cancellous bone bleeding. Haematoma formation is reduced by use of sheets of absorbable haemostatic sponge at the top of surgery in addition as expeditious removal of surrounding cancellous bone marrow. Placement of a drain into the location of surgery may additionally prevent haematoma formation. However, that's debatable topic consistent with many authors. It's the association of bacteria with the hematoma, not the hematoma itself, that causes problems with wound-healing. Infection usually results from improper technique particularly in immuno-compromised or nutritionally depleted hosts. Treatment of deep post-operative infections requires incision and drainage, irrigation, debridement and a course of culture-directed intravenous and oral antibiotics.<sup>30</sup> Bone regeneration and anatomical bone reconstruction in defects of oral and maxillofacial region are always a critical and controversial issue. To our knowledge, the biggest prospective, randomized study of the postoperative use of drains was performed by Ritter et al. In their study of 415 total joint replacements, 215 wounds were drained with a closed suction system and 200 weren't drained. The authors found no significant differences between the 2 groups with relevancy excessive postoperative drainage.<sup>31</sup> Our study also showed similar results.

## 7. CONCLUSION

We believe that closed suction drainage has no effect on wound-healing following the removal of bone from the iliac crest to be used as a graft. The amount and quality of the regenerated bone is another aspect of defect reconstruction which should be highly considered.

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