

Case Report**Use of Pedicle Groin Flap for Large Defect of Traumatic
Hand and Forearm; A Case Report****Abstract**

Traumatic skin defect of forearm and hand with exposed bone or tendon must be covered with a flap. Based on the surgeon preference and condition of the wound and patient, free flap or pedicle flap can be used. However, in situation that vessel's of recipient site have been damaged, use of free flap is contraindicated. We report a 27 year old man case of high energy trauma to the Right upper extremity with large skin defect and vascular injury. He underwent pedicle groin flap after several times of irrigation and debridement with good result. The pedicle groin flap can be a versatile and reliable flap to cover large traumatic skin defect with vascular injury.

Keyword: Pedicle Flap, Free Flap, Groin Flap , Traumatic Defect, Vascular Injury

INTRODUCTION

The pedicled groin flap was first described in 1972 by MacGregor.¹ This flap is based on the superficial circumflex iliac artery (SCIA), which is derived from the femoral artery.^{1,2}

The use of this flap is intended to cover the skin defect of distal forearm and posterior aspect of hand.^{2,3}

This flap is also used for coverage the palmar area of hand and thumb, especially if the thenar area is lost.³

Although the spread of free flaps since 1980 has reduced the attractiveness of this flap, but pedicle groin flap can be used for vast defects of forearm and hand that can not be done with a free flap.^{2,4,5}

We performed a pedicle groin flap procedure with good result for a large traumatic defect of forearm and wrist, which suffered from vascular injury and was risky for free flap procedure.

34 CASE PRESENTATION

35 A 27 year old man case of car turn over on the highway which has transferred to our hospital
36 by emergency service.

37 He had a Glasgow Coma Scale (GCS) of 15 with stable Vital signe. Examination of chest, ab
38 domen, head and neck were normal. Patient had a crush injury on the volar aspect of Right fo
39 rearm and wrist with sever contamination with soil and sand particle (fig.1).

40 X-ray showed fracture of 2nd, 3rd metacarpal bones with volar dislocation of carpal bones.

41 In exploration of wound, radial pulse was absent and flexor carpi radialis (FCR) tendon was
42 disrupted (fig.2).

43 Bulk of flexor tendons were crushed but continuity of ulnar and median nerves and other tend
44 ons were normal.

45 The patient wound underwent irrigation and debridment repeatedly until wound cleaned up.

46 Fractures of metacarpal bones and dislocation of carpal bones were reduced and fixed. In last
47 surgical procedure skin defect were covered with pedicle groin flap (fig. 3).

48 To prevent unwanted stretch on the flap pedicle, external fixator device was applied between
49 humorous and iliac crest.

50 The pedicle of flap was discontinued after 35 days of planting.

51 The result was good and patient was satisfied with the outcome of surgery (fig.4).

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53 DISCUSSION

54 The pedicle groin flap popularized in 1972 by MacGregor and was widely used for coverage
55 of skin defect in the upper extremity.^{1,2}

56 The nutritional artery of this flap is the SCIA, which is itself a branch of the femoral artery, a
57 nd in 50% of cases it has a common trunk with superficial inferior epigastric artery.^{1,2,6}

58 The origin of SCIA is 3cm below the center of the inguinal ligament.³

59 The venous drainage of this flap is to the superficial circumflex iliac vein and superficial infe
60 rior epigastric vein, which both of them may drian to the femoral vein separately or maybe joi
61 n to the saphenous bulb.^{1,2,3,6}

62 In general, the venous drainage of this flap is superficial, and deep drainage dose not play a r
63 ole.^{1,2,3,5}

64 Advantages of this flap are:^{1,3,6}

- 65 1. Short vascular pedicle.
- 66 2. Lack of good innervation.
- 67 3. Large thickness in obese patient.

68 4. Likely color difference with receiver location.

69 Since the 1980s, with the development of free flaps, attractiveness of the axial pedicle groin f
70 lap has fallen, but in cases where recipient area vessels have been damaged (such as trauma o
71 r irradiation) the use of free flap is contraindicated.^{2,5,7}

72 The disadvantages of free flap procedure include:^{4,5,7}

- 73 1. Longer duration than axial pedicle flap.
- 74 2. The surgical procedure maybe difficult and boring.
- 75 3. Risk of thrombosis and complete failure of flap.
- 76 4. High risk of flap failure compared with pedicle flaps. (10% to 30% failure rate for
77 free flap)
- 78 5. Greater risk of reoperation after free flap procedure (about 25%).
- 79 6. Prolonged risk of vascular complications up to 10 days after surgery, especially in the
80 first 24 hours.

81 Free flap surgery can be done in one stage procedure, but pedicle flap procedure needs a smal
82 l surgical procedure for cut off the base.

83 In this patient, due to vascular injury, risk of free flap failure was very high, which is why the
84 pedicle flaps was used.

85 In conclusion this case report, acknowledges that the pedicle groin flap is a reliable flap that c
86 an be used in large traumatic upper limb defects along with vascular injury.

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88 **References:**

- 89 1. MCGregor Ia, Jackson IT. The groin flap Br J Plast Surg. 1972; 25: 3-16
- 90 2. O'Brien B, Ma C, Macleod AM, Hayhurst JW, Morrison WA. Successful transfer of a
91 large island from the groin to the foot by micro vascular anastomosis. Plast Reconstr
92 Surg. 1973; 52: 271-78
- 93 3. Chuang DC, Colony LH, Chen HC, Wei FC. Groin Flap design and versatility. Plast
94 Reconstr Surg. 1989; 84: 100-7
- 95 4. Acland RD. The free iliac flap. A Lateral modification of the free groin flap. Plast
96 Reconstr surg. 1979; 64: 30-6
- 97 5. Hough M, Fenn C, Kay SP. The use of free groin flap in children. Plast Reconstr Surg.
98 2004; 113: 1161-6
- 99 6. Goh TL, Park SW, Cho Y, Choi JW, Hong JP. The search for the ideal skin flap:
100 Superficial circumflex iliac artery perforator flap a review of 210 cases. Plast
101 Reconstr Surg. 2015; 135: 592-601

7. Dragas M, Davidovic L, Kostic D, Markovic M, Pejkić S. upper extremity arterial injuries: factor influencing treatment outcome injury. 2009; 40: 815-9
8. Arner M, Moller K. Morbidity of the pedicled groin flap. A retrospective study of 44 cases scand J Plast Reconstr Surg Hand Surg. 1994; 28: 143-6

Figures:



Fig.1 Patient wound on arrival the emergency room that is full of Sand and Soil particle.



Fig.2 Crush injury of forearm extending to the wrist and thenar area.



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Fig 3 (a)



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Fig 3 (b)

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Fig. 3 (a, b) Patient wound after Coverage with pedicle groin flap.



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Fig 4 (a)

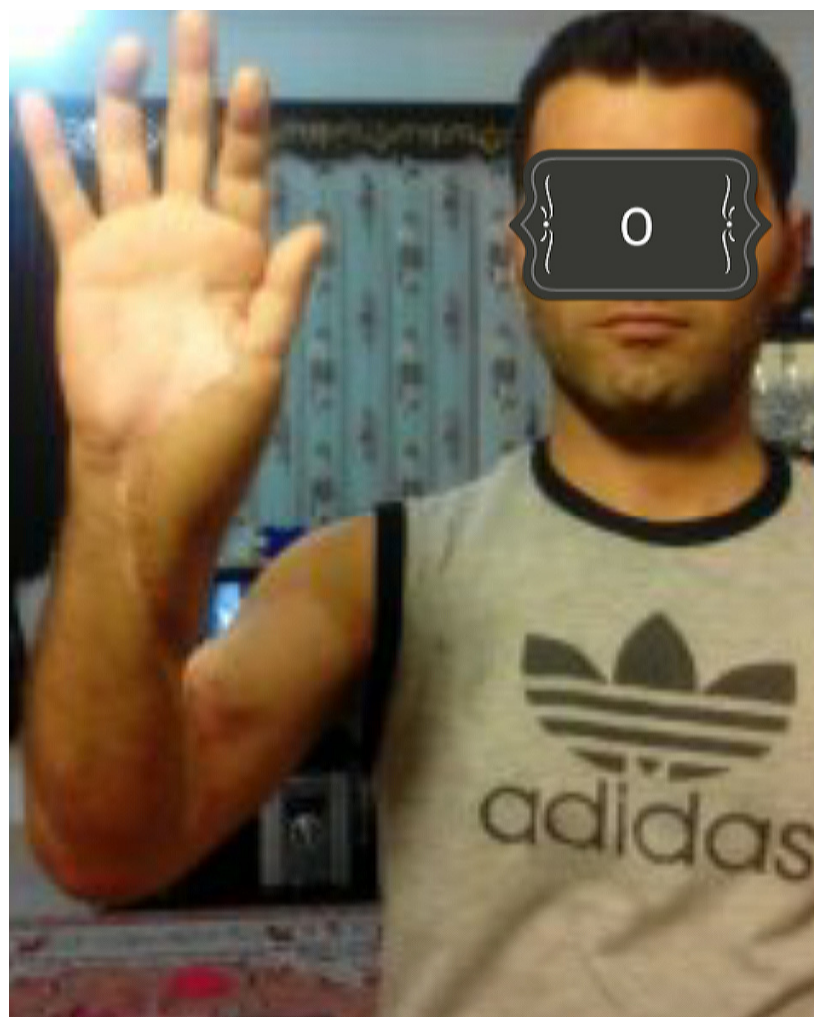


Fig 4 (b)

Fig 4 (a,b) Wound after cut off the pedicle.

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