Original Research Article

Modified technique to cover the defects of inguinal and lower abdominal defects

Krishna Prasad Prusty[1*], Sivasai Krishna Prasad.K[2]

[1]Department of Surgery, Associate Professor, Gitam Institute of Medical Sciences and Research Vishakhapatnam, Andhra Pradesh, India

[2]Associate Professor, Department of General Surgery, Gitam Institute of Medical Sciences, Visakhapatnam Andhra Pradesh, India

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Abstract

Background: The defects over the groin and lower abdominal region is a challenging problem following inguinal block dissection, for the tumours of genitalia and lower abdomen.The aim of the paper is to highlight the coverage of the defect with a modified technique which includes the coverage of both inguinal and lower abdomen defects.**Patients and methods**:This is a follow up study of defects over the inguinal and lower abdomen region from January 2015 to January 2020 for a period of 5 years .Results;There were about 19 patients were treated with this technique and results were found satisfactory.**Conclusion**:We conclude that this approach of the covering the defects of inguinal and lower abdomen with including the lateral branch of circumflex femoral artery gives a better outcome and stable cover.

Keywords:Modified technique ,inguinal and lower abdominal defects.

Introduction

Inguinal block dissection is carried out for the skin malignancies at the genitalia and lower limb region.the wound complications like skin necrosis ,infection,lymphorrhagia,lymphedema occurs following inguinal block dissection.occsionally the trauma and electrical burns may be the cause. morbidity can be reduced by providing a stable cover which provides coverage to the femoral vessels, obliterates the dead space,and promotes wound healing. Reconstructive options which include currently available are tensor fascia Lata, anterolateral thigh flap ,rectus abdominis flap etc.We present a modified technique which gives robust blood supply and stable cover,reduces the risk of wound dehiscence,improves the tolerance to radiotherapy[1].

Patients and methods

The study was conducted at the GITAM Institute of medical sciences and research, Vishakhapatnam from January 2015 to January 2020.

The post operative period following the reconstructive surgery, hospital course and follow up after radiotherapy were noted.

Anatomy

The femoral artery gives off the profunda femoral branch ,which arises 2-5 cm below the inguinal ligament and further divides in to the medial and lateral circumflex femoral arteries. The lateral circumflex femoral artery further divides in to ascending ,transverse and descending branch.Behind the rectus femories muscle the transverse branch gives to TFL muscle.The descending branch passes caudally on the vastus lateralis muscle and can be seen retracting the rectus femories muscle. The skin over the lateral thigh is supplied by perforators arising from these branches(both musculocutaneous and sept cutaneous).the vascularity of the skin ,subcutaneous tissue and the TFL flap is based on the excellent longitudinal network of vessels overlying the iliotibial tract formed by anastomosis between branches of transverse branch of lateral circumflex femoral and individual branches of profunda femories which emerge along the lateral intermuscular septum.At the mid point of the line joining the ASIS and the superolateral border of patella ,the descending branch give medial and lateral branches. the lateral descending branch of lateral circumflex artery provides fasciocutaneous branches to anterolateral thigh flap.

Surgical technique

Surgery was performed under general or spinal anesthesia with patient in supine position .the soft tissue defect following block dissection or debridement was measured.The central axis of the flap is indicated by the line joining the ASIS to the superolateral border of patella .at the mid point of this line the hand held doppler was used to identify the location of perforators.they were marked and marking done with methylene blue marker .a line is drawn 3 cm behind this line which represents the anterior border of tensor fascialata. A point , representing the vascular pedicle ,is marked 6 cm-10 cm below the ASIS.The pedicle was confirmed by hand held Doppler[2].

Flap marking

The vertical line (denotes the anterior border of the flap) is drawn at the medial end of the defect and continued down about 8-10 cm above the knee joint .The line extends upwards up to the greater trochanter which denotes the posterior border of the flap.Flap dissection and insetting in the defect.The flap dissection usually begins at the medial border of the defect.the flap elevation then proceeds in the subfascial plane, from anterior to posterior position. the posterior caudal flap incision facilitates flap elevation and exposure of the cutaneous branches arising in the intermuscular septum between the rectus femories and vastus lateralies muscle. These branches were included in the flapand the lateral branch of desending branch of lateral circumflex femoral artery was included the flap[3]. The incision extended posteriorly till the greater trochanter and the pedicle supplying The TFL also included in the flap in the same manner.the flap is then inset over the defect over inguinal region under closed suction drain.

**Correspondence*

Dr. Krishna Prasad Prusty

Associate Professor, Department of Surgery, Gitam Institute of Medical Sciences and Research, Vishakhapatnam, Andhra Pradesh, India.

E-mail: drkrishna27@gmail.com

For lower abdominal defect both pedicles were islanded till the origin from the circumflex femoral vessels to profunda femoris vessels. The flap inst over the lower abdominal defects ,the intermittent skin between the defect and the flap was excised. The flap inset over the defect under closed suction drain .The donor site defects over the thigh covered with spilt skin graft, harvested from opposite thigh and tie over dressing done.

Results

Inguinal region

Fifteen patients presented with malignant tumours involving the inguinal nodes ,two patients presented defects following trauma,twp patients presented following the electrical burns.

Lower abdomen defects

Four patients presented following malingnant tumours at the lower abdomen .the age ranging from18 to 59 years.out of them 4 were males and 2 were females.The size of the defects were ranging from 20+10cm to 30+15 cm.these defects were extending below umbilicus to pubic symphysis and laterally between two ASIS[4].

Patient with fungating right sided inguinal lymph nodes

A 48 year male presented with fungating inguinal lymph nodes on the left side.He had previously undergone surgery for carcinoma of penis previously(fig 1).The inguinal defect was covered with this modified technique. The healed well in the post op and the spilt skin graft take was good .

Fig 1: Surgery for carcinoma of penis

Patient with soft tissue defect over inguinal region

A 30 year male was involved in the road traffic accident ,resulting in a soft tissue defect over inguinal region(fig2).The patient was stabilised and the debridement of the wound was done. The patient was not having any blunt trauma over abdomen. The resulting defect was covered with this modified technique. The flap and spilt skin graft healed well.

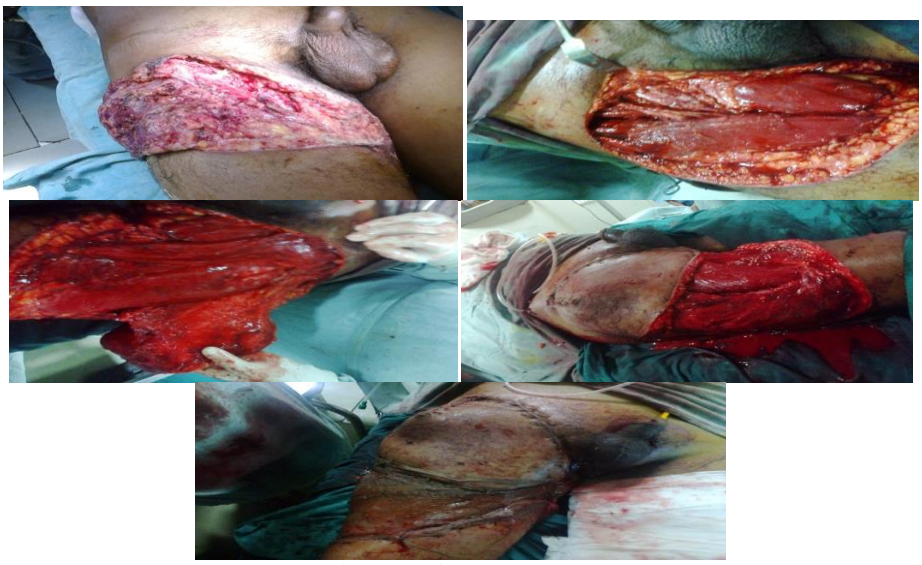

Fig 2: soft tissue defect over inguinal region

Patient with lower abdominal defect

A 36 year female presented with malignant tumour over lower abdomen.The plan was made to reconstruct the defect with the modified technique (fig 3).The wound healed well.she was treated with radiotherapy post operatively.

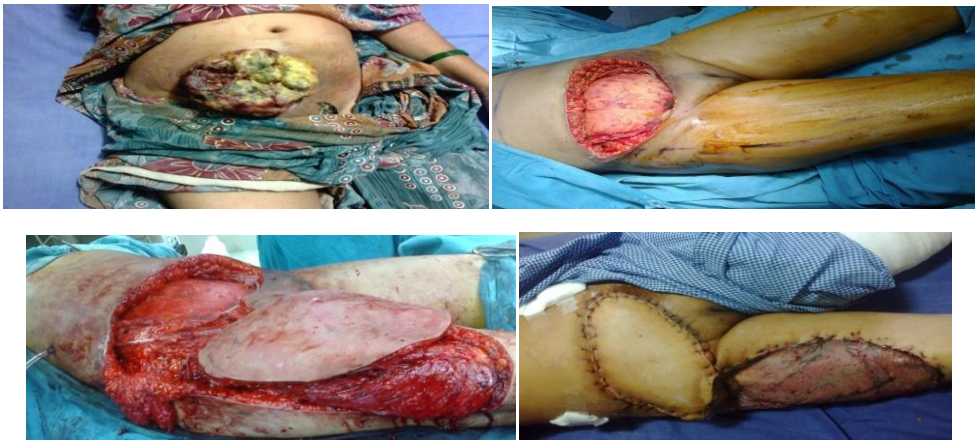

Fig 3: Reconstruction of the defect with the modified technique

Table 1:Patients treated with modified technique for inguinal defect

Age	Diagnosis	Defect dimensions
1. 59yrs m	ca penis with inguinal nodes	20+10cm
2. 44yrs m	ca penis with inguinal nodes	18+9 cm
3. 30yrs m	post trauma	20+12cm
4. 45yr m	post electric burn	15+10 cm
5. 50yr f	ca ovary with inguinal defect	25+12cm
6. 48yr m	ca penis with inguinal defect	30+15 cm
7. 43yr f	ca ovary with inguinal defect	22+10 cm
8. 40 yr m	ca penis with inguinal defect	25+12cm
9. 45 yr m	scc leg with inguinal defect	25+12cm
10.35 yr m	post trauma	20+12 cm
11.40 yr m	scc leg with inguinal defect	28+15 cm
12.42yr m	ca penis inguinal defect	22+10 cm
13.49 yr m	scc leg with inguinal defect	20+10 cm
14. 59 yrs m	ca penis with inguinal defect	30 +15cm
15. 18yrs m	post trauma defect	15+1

Table 2:Patients treated with modified technique for lower abdominal defects

Age	Diagnosis	Dimension of the defect
36 yr f	soft tissue sarcoma	30+15 cm
45 yr f	scc lower abdomen	25+15 cm
44 yr m	recurrent soft tissue sarcoma	28+15 cm
35 yr m	desmoid tumour	25+15cm

Out of ninteen patients who were treated for the inguinal defects ,two patients developed marginal necrosis at the suture line at the 4-5th post op day .they were treated with debridement of the wound and again closure done by re rotation of the flap.the donor site defects over thigh were covered with skin graft. None of the patients had failure of the flap or necrosis of the flap. the drains were removed on the 6-7th day. sutures were removed on 14-17 days.Out of 6 patients operated for the lower abdomen defect ,none of them had necrosis of flap. The drain were removed on 10-14 days. The sutures were removed on 14-17 days post op. all patients were mobilised after two weeks.

Discussion

Lymph node involvement is an important prognostic marker in primary skin malignant tumour of genital ,anorectal region ,lower extremity. The clinical presentation of the locally advanced primary and nodal disease is not uncommon in India. The surgery may be a curative or palliative in such presentations requires radical surgery for the primary tumour and enbloc inguinal lymphadenectomy. The inguinal block dissection has been always associated with high incidence of wound complications. The potential complications are infection(6-20%).lymphorrhagia (6-40%),lymphedema(8-69%),skin flap necrosis (27-85%).removal of the adipofacial layer in the groin dissection damages the subdermal plexus potentially leading to skin flap necrosis .hence these patients require a stable coverage over the operated site for the prevention of tissue oedema ,fibrosis and complication due to wound healing.Trauma to inguinal region with soft tissue defects is not uncommon. High index of suspicion for injuries to the femoral vessels is needed in such cases with soft tissue defect over inguinal region ,there is always need for stable soft tissue coverage over these major vessels to salvage the lower limb. The aim of primary reconstruction to cover the vessel, reduce the dead space, decrease seroma formation ,wound closure without tension, initiation of radiotherapy as early as possible. And to reduce hospital stay.

Reconstructive options available for the coverage of inguinal defects include random pattern flaps,tensor fascialata flap,perforator propeller TFL flap,gracilis flap,sartorius flap,rectus femoris flap.skin grafting won't provide sable coverage over bones,nerves,and vessels.free tissue transfer requires microvascular expertise.insuch situations sufficient soft tissue coverage can be achieved by simple and reliable techniques with minimal morbidity[5].The modified flap includes the perforators from the desending branch of lateral circumflex femoral vessels and transverse branch of lateral circumflex vessel.so the flap has roboust blood supply.how ever there is a possibility of the rerotation of the flap if there is marginal necrosis of flap occursThe perforator TFL flap was first described by Deiler.et.alas a free tissue transfer for achillis tendon defects. Kimura et.al further defined the microdissection technique and emergence of septocutaneous perforates between the gluteus medius and TFL muscle.Vegas & martin-hervas described the distribution of the branches to the skin from the perforator between the TFL muscle, gluteus medius & minimus muscles.as a propeller flap the perforator flap could be utilised to cover a defect over inguinal region.there is need of microvascular expertise ,the utilisation of the intramuscular dissection time,the possibility of venous congestion and division or non inclusion of the cutaneous nerves with in the flap are the disadvantages experienced ,while performing the procedure.our modified flap relies on multiple perforators without sacrificing neural component and has decreased risk venous congestion[6].Other flaps utilised in the reconstruction of the soft tissue defect at inguinal region include rectus femoris muscle flap ,vertical rectus abdominis flap .all these flaps are reliable & Provide good soft tissue coverage but at the expense of functioning muscle[7].After the advent of the angiosomal concept and perforator flaps. Skin and subcutaneous tissue only flaps could be elevated in these regions by preserving the perforators through the areas of TFL .the vascular anatomy of TFL was further studied in detail by Hubmer .et.al.the author described the blood supply of the TFL as the ascending branch of the lateral circumflex femoral artery with multiple direct septocutaneous and indirect musculocutneous perforators .clinically an additional ultrasound doppler is necessary to ensure the perforator point of the flap .but there is always a variation in this region (4-23%). so.avoiding a perforator flap will provide all the advantages of the donor site morbidity and other difficulties[8].In our present study the modified flap provide a soft tissue coverage over the femoral vessels ,reducing the risk of wound dehisenceand lymphatic drainage problems. This flap includes rich blood supply,the flap can be designed for any kind of defect at the inguinal and abdominal defects. The technique is simple operating time (approx. 50-60 mins)and appears to be reliable flap for the coverage of the femoral vessels and inguinal region and lower abdomen with good tolerance to radiotherapy.Locally advanced genital malignancies as well as advanced stage cutaneous melanomas of the lower extremity are common in Asian population.Radical surgery for the primary and enbloc inguinal or ilio inguinal lymphadenectomy is often required in such situation .post traumatic soft tissue defects in the inguinal region are not uncommon[9].To reduce the complications related to wound healing in the groin region and to with stand post operative radiotherapy, there is need for a simple ,reliable flap in such patients.so our modified technique can be suceesfully used to reconstruct the inguinal region and lower abdomen & early radiotherapy.

Conflict of Interest: Nil
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