**Evaluation of the Thoracodorsal Artery Perforator Free Flap in Extremity Reconstruction with Preoperative Computed Tomography Angiography for Perforator Mapping**


**Abstract:**

**Background**:

Due to the anatomical intricacy of the extremities, wound assessment must be meticulous. Coverage planning should account for tissue availability, function, and cosmesis. While local flaps suffice for smaller defects, extensive wounds necessitate early debridement via the pseudotumor technique, with free flap reconstruction completed within three days of injury when clinically feasible. We aim to confirm the versatility of using the free thoracodorsal artery perforator flaps for reconstructing soft tissue defects in the extremities, observe the appearance of the donor area and the recovery of extremities' function after surgery, and the role of preoperative CT angiography for perforator mapping on outcome.

**Patients and methods:**

Twenty patients with soft tissue extremity defects were prospectively recruited from two centers: the Plastic Surgery Unit, General Surgery Department, Faculty of Medicine, Benha University Hospital, and the Plastic Surgery Department, Faculty of Medicine, Al-Azhar University. The study period extended from April 2024 to December 2025, with consistent eligibility criteria applied throughout.

**Results**:

A total of 20 patients with extremity soft tissue defects were included in this study. The mean age was 32 ± 12.5 years, with a male predominance (75%). Trauma was the most common etiology (60%).

Preoperative CT angiography (CTA) demonstrated high accuracy in perforator localization. Postoperative complications occurred in 50% of cases. Functional outcomes showed low disability scores in upper limb cases (mean Quick DASH score: 22.6%) and moderate functional recovery in lower limb cases (mean LLCS: 21.5).

**Conclusion:**

The use of CTA did not result in a noticeable decrease in ischemia time or perforator dissection time, nor did it prevent the occurrence of flap-related complications. Therefore, its routine use in TDAP flap planning appears to offer limited additional benefit compared to simpler and less invasive modalities.



**Keywords:** Thoracodorsal artery perforator free flap, extremities reconstruction


## Introduction:

The complex anatomy of the extremities makes proper injury assessment particularly important. The available tissue and the need to balance functional outcomes with cosmetic considerations determine the best method for achieving wound coverage. In practice, choose the simplest reconstructive option that adequately addresses the defect. Surgeons often use local flaps for smaller wounds. However, in larger or more complicated defects, perform early and thorough debridement, preferably using the pseudotumor technique. If needed, perform free flap reconstruction within the first 72 hours, provided there are no contraindications [1].

Surgeons resort to free tissue transfer when local flaps are not feasible, especially if they cannot safely harvest flaps outside the zone of injury or when extensive defects expose critical structures such as bone, tendons, nerves, or vessels. They also commonly select this approach after tumor excision or severe soft tissue infections. Free flaps provide various tissue components, allowing more comprehensive reconstruction and enabling earlier functional recovery [2].

Since the first successful free flap transfer in 1973, continuous progress in microsurgical techniques and instruments has significantly improved outcomes. The introduction of perforator flaps, in particular, marked an important step forward. With flap survival rates increasing from 79% to around 96%, the focus has gradually shifted toward improving both function and aesthetic results at the recipient and donor sites. Current reconstructive approaches tend to be more individualized, aiming to meet both functional needs and cosmetic expectations for each patient [3].

In clinical practice, complex extremity defects are not uncommon. They are usually the result of trauma, tumor resection, or, less frequently, congenital conditions [4]. With the evolution of perforator flaps, surgeons are no longer concerned only with flap survival, but also with achieving better contour and minimizing donor site morbidity [5].

As a result, flap selection has become more tailored. Rather than using standard or non-specific options, surgeons now choose donor sites based on the specific characteristics of each defect, and flap design is adjusted accordingly to achieve better overall outcomes [6].

The anterolateral thigh (ALT) flap remains one of the most commonly used options in soft tissue reconstruction. It provides a relatively large amount of tissue and has a consistent vascular anatomy, which makes it reliable in many situations [7]. However, in overweight patients, the flap may be relatively thick, which can limit its suitability for more superficial defects of the extremities. Additionally, the resulting scar on the thigh may be less aesthetically acceptable, particularly in female patients. For these reasons, the thoracodorsal artery perforator (TDAP) flap can be considered a good alternative, as the donor site is more concealed [8].

The TDAP flap was first described by Angrigiani in 1995 and has since been widely used in extremity reconstruction. Its popularity is mainly due to advantages such as a hidden donor site, relatively straightforward dissection, and consistent vascular anatomy [3,9].

Proper preoperative planning is important when using a TDAP free flap. Multidetector-row computed tomographic angiography (MDCT) is helpful in identifying the location of perforators

[10]. However, detecting thoracodorsal artery perforators using CT can be challenging because of their small size. Although anatomical landmarks may sometimes help, variations between patients can reduce their reliability [11]. In addition, Doppler flowmetry has been shown to have limited sensitivity and a relatively low positive predictive value in this setting [12].

## Patients and Methods:

A prospective study was conducted on 20 patients with soft tissue defects of the extremities at Benha University and Al-Azhar University hospitals (April 2024 – December 2025).

### Ethical Approval:

Ethical approval was obtained from the research and ethics committee of Benha University. All patients provided written informed consent.

### Participants:

**Inclusion:** Adults of both sexes with extremity soft tissue defects, clean wounds (with healthy fractured/intact bones), exposed tendons/nerves/vessels, or contracture scars.

**Exclusion:** Vascular disruption or chronic vascular disease, unfit for microvascular surgery, infected wounds, severe psychiatric disorders.

### Preoperative:

All patients underwent full clinical and laboratory evaluation. CT angiography was performed to identify thoracodorsal artery perforators (TDAP).

### Operative Technique:

Under general anesthesia (lateral decubitus position), the flap was designed along the major TDAPs. The dominant perforator was traced through the latissimus dorsi muscle to the descending branch of the thoracodorsal artery. The skin island was circumcised with deep fascia, and the neurovascular pedicle was dissected. Donor sites were closed directly (if <8–9 cm) or with split-thickness skin grafts.

Two teams prepared the recipient site and elevated the flap simultaneously. Microvascular anastomosis was performed (artery first, then vein) using 8/0 or 9/0 Prolene.

### Postoperative:

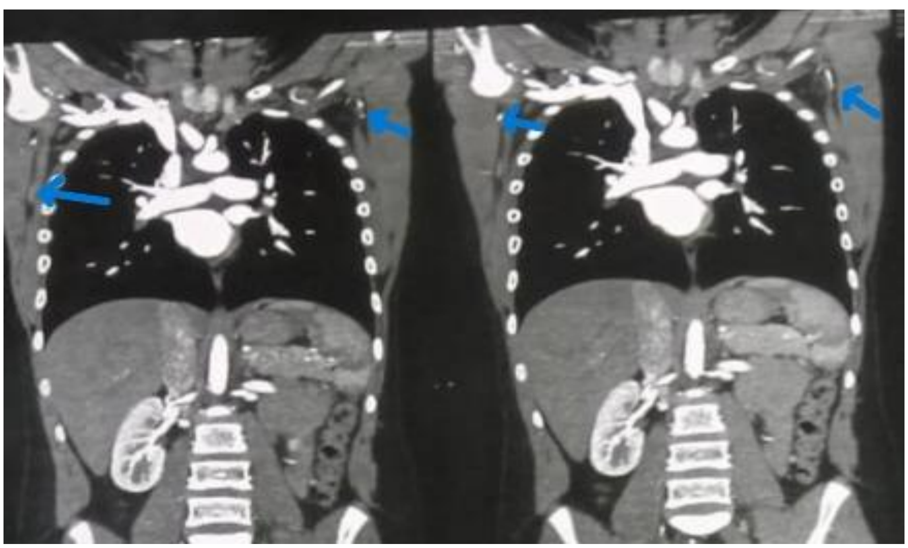
Patients were monitored in the ICU for 24 hours with strict limb elevation. Flaps were assessed clinically and by Doppler (every 2 hours for 24 hours, then decreasing frequency). Medications included antibiotics, analgesics, and low molecular weight heparin. Hematoma surveillance, hydration, and urine output (0.5–1 mL/kg/hr) were maintained.

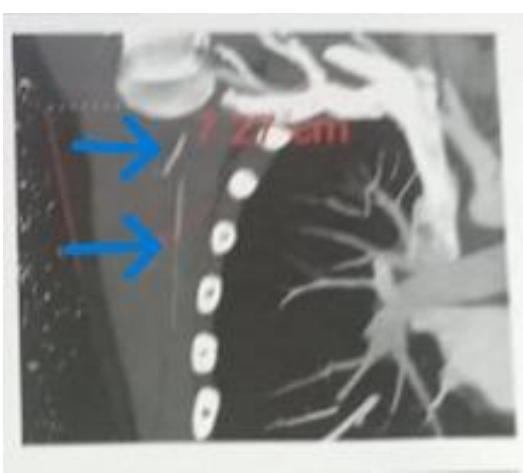
### Follow-up:

Patients were hospitalized for 7–10 days and followed for 3–6 months. Outcomes included functional assessment (QuickDASH for upper limb and Lower Limb Scoring System), aesthetic outcome (Vancouver Scar Scale), and donor site (Likert scale).

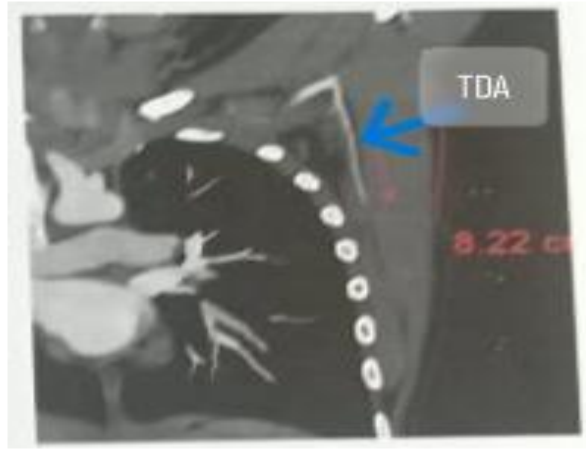
**Cases:**


**<u>FIGURE (1):</u> Male patient 13 years old with unstable scar of right heel after RTA .**

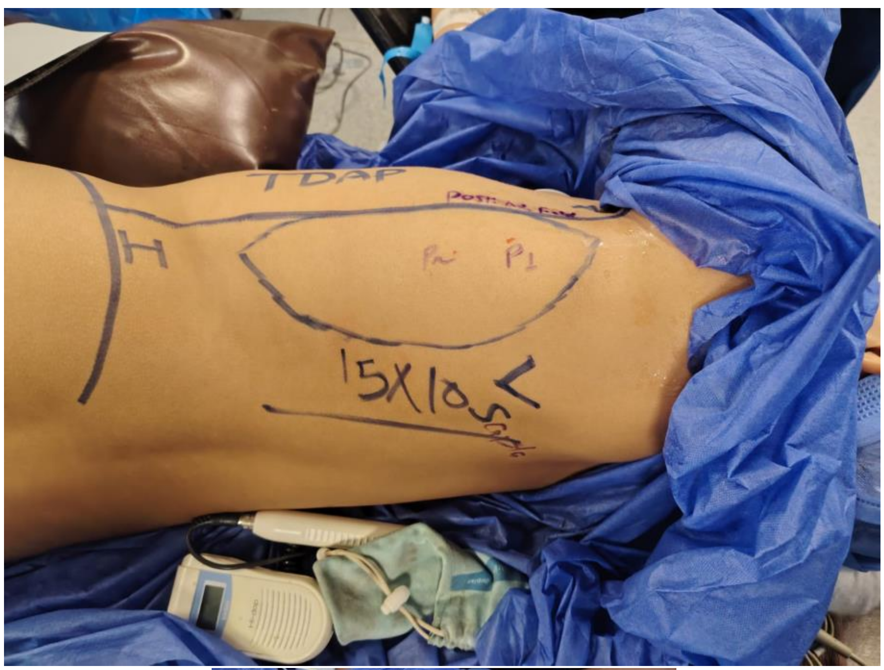




**<u>Figure (2):</u> CT Angio for TDAP (BLUE ARROWS). For male patient**




**<u>Figure (3):</u> PERFORATOS OF TDAP (2 BLUE ARROWS) and TDA (SINGLE ARROW)**





**<u>Figure (4):</u> preoperative marking of TDAP flap with detection of 2 perforators by handheld doppler in correlation with contrast-enhanced imaging.**

**Figure (5):** preoperative positioning of the patient

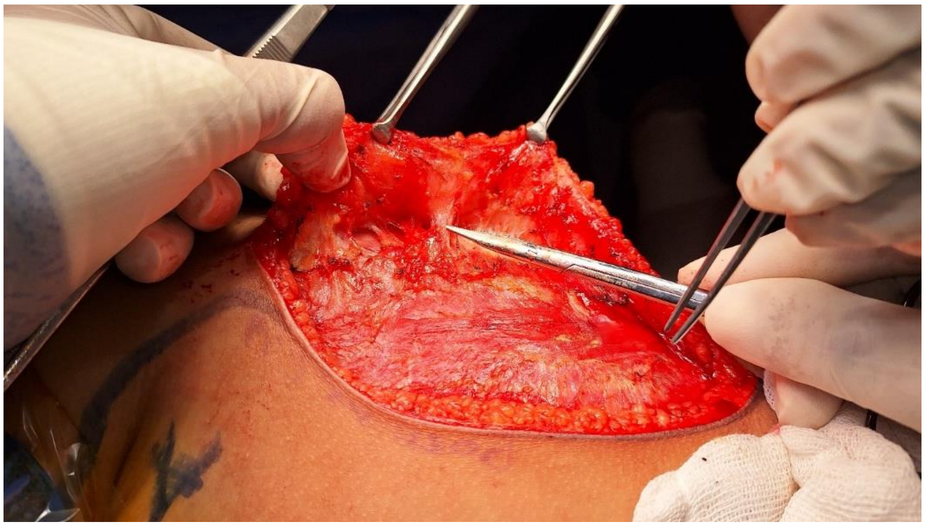
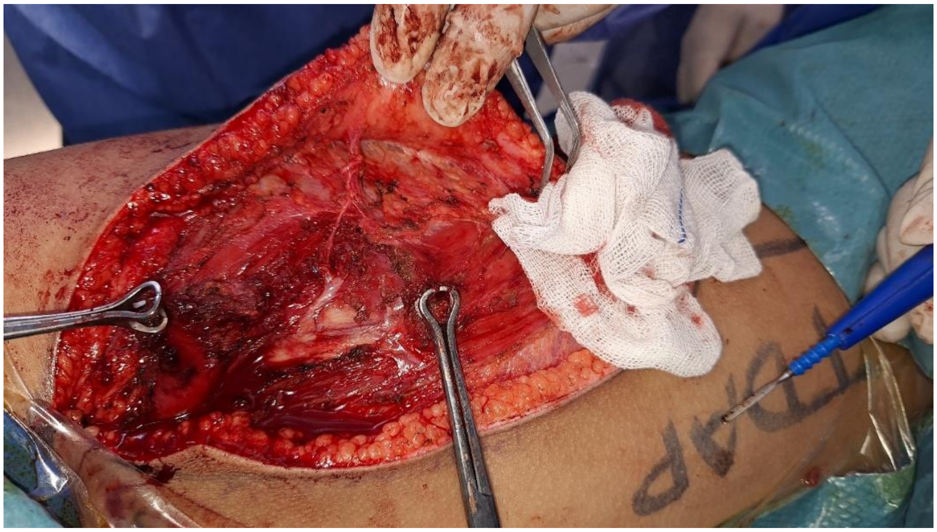
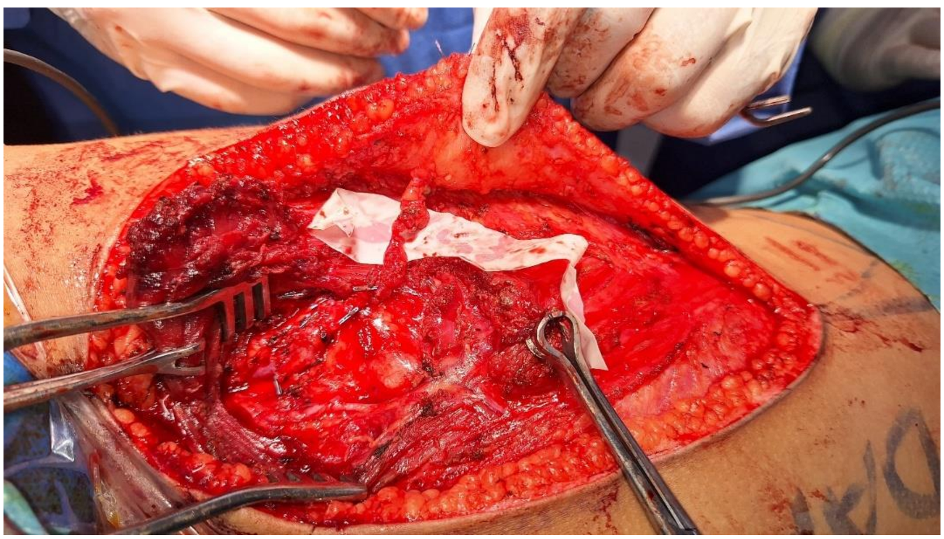


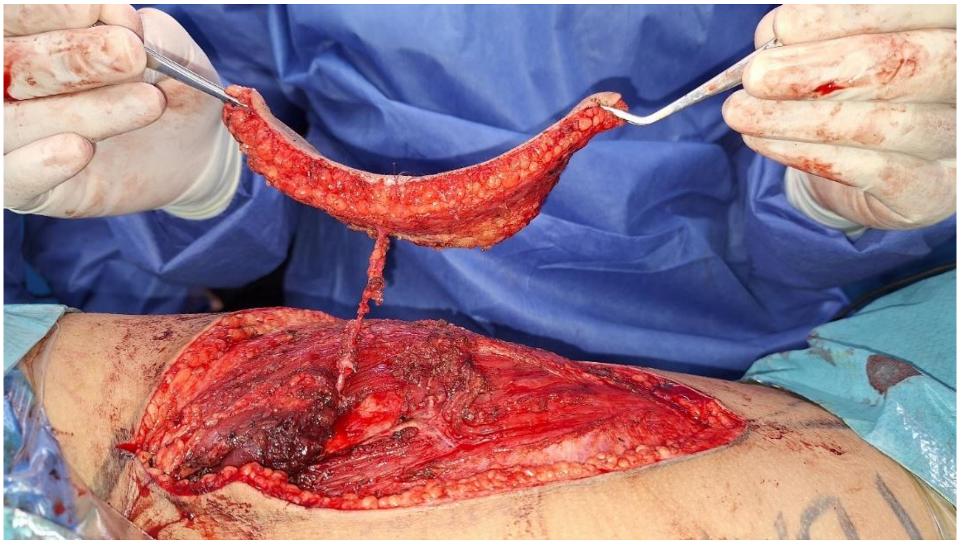
**Figure (6):** detection of the main perforator .



**<u>Figure(7):</u> dissection of the main TDAP perforator.**



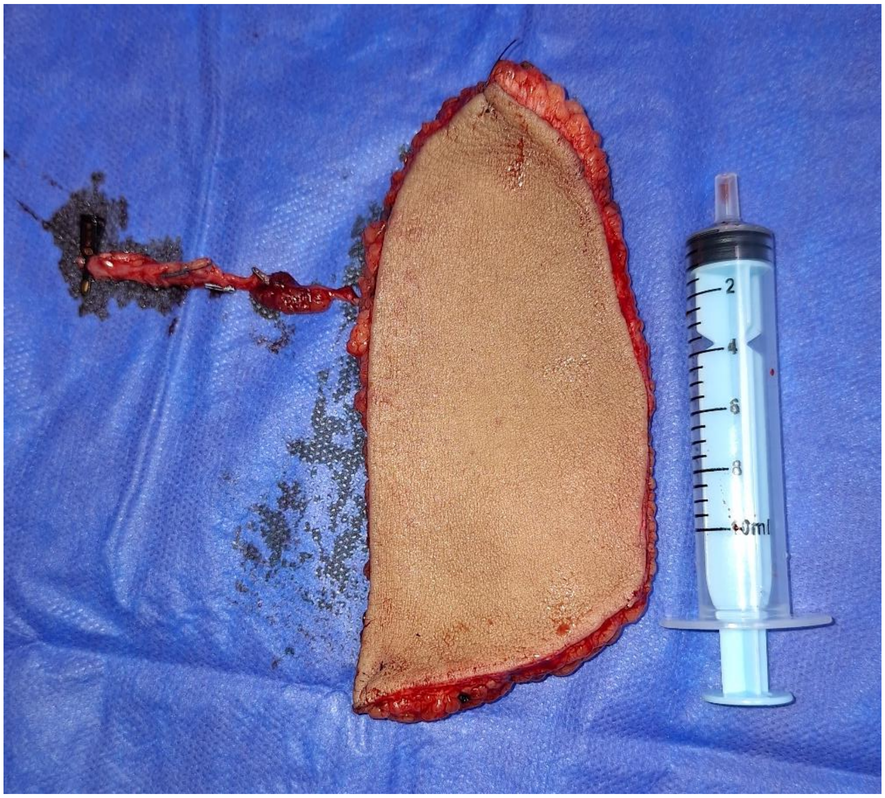
**<u>Figure (8):</u> main TDAP perforator**



**<u>FIGURE (9):</u> complete dissection of the TDAP flap**.

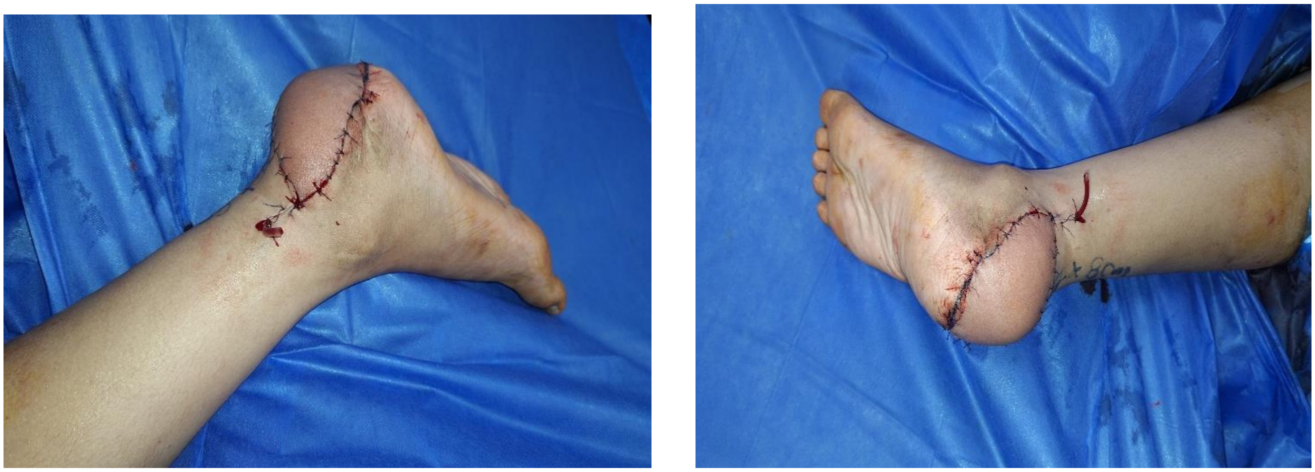
**<u>FIGURE (10):</u> preparation of recipient site at right heel with dissection and skeletonization of posterior tibial artery pedicle.**

**<u>Figure (11):</u> After complete excision of the scar and preparation for anastomosis.**




**<u>Figure (12):</u> flap and pedicle after separation and prepare for anastomosis**

**<u>Figure (13):</u> after anastomosis of artery and vein of TDAP with posterior tibial artery.**



**<u>Figure (14):</u> application of flap with primary repair of all edges of wound with drain to avoid hematoma.**

**<u>Figure (15):</u> dressing of flap with marking of perforator (red dot) for follow up.**

**<u>Figure (16):</u> Primary closure of donor site over tube drain.**

**<u>Figure (17):</u> follow up after 1 week.**

**<u>Figure (18):</u> follow up after 2 weeks**

**<u>Figure (19):</u> follow up after 1 month**

**Statistical Analysis:**

All collected data were statistically analyzed using SPSS software (version 26.0; SPSS Inc., Chicago, IL, USA). Normally distributed quantitative variables were expressed as mean ± standard deviation with ranges, whereas non-parametric data were reported as median with interquartile range (IQR). Categorical variables were summarized as frequencies and percentages. The Kolmogorov-Smirnov and Shapiro-Wilk tests were employed to assess data normality.

For inferential analysis, the independent-samples t-test was applied to compare means between two independent groups, while the paired-samples t-test was used for related samples. Differences in categorical variables between groups were evaluated using the Chi-square test, with Fisher's exact test substituted when any expected cell count fell below five.

A 95% confidence interval was adopted throughout, with a significance threshold set at $p < 0.05$. Results were interpreted as follows: $p > 0.05$ was deemed non-significant, $p < 0.05$ was considered statistically significant, and $p < 0.001$ was regarded as highly significant.

## Results:

The results are presented in the following tables and figures:

We applied our prospective interventional study on 20 patients, with the same inclusion and exclusion criteria, aiming to confirm the versatility of using the free thoracodorsal artery perforator flaps for reconstructing soft tissue defects in the extremities, observe the appearance of the donor area and the recovery of extremities function after surgery, and the role of preoperative CT angiography for perforator mapping on outcome.

**Table (1):** Demographic data distribution among study group.

| **Demographic data** | **Total (n=20)** |
|---|---|
| **Age "years"** | |
| *Mean±SD* | *32 ± 12.5* |
| *Range* | *13-55* |
| **Sex** | |
| Female | 5 (25%) |
| Male | 15 (75%) |

*Data are expressed as mean(SD), or N (%)*

The demographic data distribution among the study group reveals that the mean age is 32 ± 12.5 years, and an age range of 13-55 years. In terms of sex, males account for the highest proportion (75 %, n=15), followed by females (25%, n=5).

**Table (2):** Etiology of defects distribution among study group**.**

| **Mode of trauma** | **No.** | **%** |
|---|---|---|
| Trauma | 12 | 60.0% |
| Burn | 4 | 20.0% |
| Malignancy | 3 | 15.0% |
| Unstable scar | 1 | 5.0% |

*Data are expressed as mean(SD), or N (%)*

Table (2) showed descriptive statistics regarding etiology of defect for patients included in this study; most of them are post-traumatic 12 patients (60%), followed by 4 patients (20%) who were post burn,  then the 3 patients (15%) who suffering from post-burn marjolin ulcer and finally 1 patient with unstable scar (5%).

**Table (3):** CTA Perforator Characteristics distribution among study group

| **Diameter of perforator in mm** | **No.** | **%** |
|---|---|---|
| 1.1 | 1 | 5.0% |
| 1.2 | 3 | 15.0% |
| 1.3 | 3 | 15.0% |
| 1.4 | 6 | 30.0% |
| 1.5 | 3 | 15.0% |
| 1.6 | 3 | 15.0% |
| 1.7 | 1 | 5.0% |
| Total | 20 | 100.0% |

*Data are expressed as mean(SD), or N (%)*

Table (3) showed descriptive statistics regarding CTA identified two perforators in all cases (100%). The mean dominant perforator diameter was 1.4 ± 0.16 mm.

**Table (4):** Ischemia time distribution among study group.

| **Ischemia time** | | |
|---|---|---|
| *Mean±SD* | *36.6 ± 6.8* | |
| *Range* | *30-48* | |
| **Ischemia time distribution (n=20)** | **No.** | **%** |
| *Ischemia time ≤ 40 minutes* | *15* | *85%* |
| *Ischemia time > 40 minutes* | *3* | *15%* |

**Table (4)** showed descriptive statistics regarding ischemia time distribution among study group with a mean and standard deviation of 36.6 ± 6.8. The majority of cases had an ischemia time equal or less than 40 minutes (15 cases) with 85%. Only 3 cases had an ischemia time more than 40 minutes (15%). Regarding dissection Time: The time required for perforator dissection averaged 1.51 ± 0.25 hours.

**Table (5):** post-operative complications distribution among study group.

| **Complication** | **No.** | **%** |
|---|---|---|
| Total flap loss | 5 | 25.0% |
| Wound infection | 2 | 10.0% |
| Venous congestion | 3 | 15.0% |
| No complications | 10 | 50.0% |

**Table (5)** showed descriptive statistics regarding complications among study group. Overall flap survival rate was 50%. Total flap loss occurred in 25% of cases ( 5cases ) , while 10% of patients experienced wound infection and 15% experienced venous congestion with 3 cases .

**Table (6):** Anatomical site of defect distribution among study group.

| **Anatomical site** | **No.** | **%** |
|---|---|---|

| | | |
|---|---|---|
| **lower Extremity (Total)** | 13 | 65.0% |
| Leg / Thigh | 7 | 35.0% |
| Foot / Ankle / Heel | 6 | 30.0% |
| **Upper Extremity (Total)** | 7 | 35.0% |
| Arm / Elbow | 4 | 20.0% |
| Forearm / Wrist / Hand | 3 | 15.0% |
| Total | 20 | 100.0% |

**Table (6)** showed descriptive statistics regarding anatomical site of defect distribution among study group. Majority of cases was in lower extremity with 65%, while upper extremity was 35% of cases.

**Table (7):** Donor site closure distribution among study group.

| **Donor site closure** | **No.** | **%** |
|---|---|---|
| Primary ( direct ) closure | 15 | 75.0% |
| Split thickness skin graft | 4 | 20.0% |
| Primary closure with v-y advancement flap | 1 | 5.0% |

**Table (7)** showed descriptive statistics regarding donor site closure distribution among study group. Majority of cases 'donor site closed directly with about 75 %( 15 cases). 4 cases' donor site closed by application of split thickness skin graft (20%), while 1 case's donor site closed by advancement of v-y flap (5%).

**Table (8):** Pedicle length distribution among study group.

| **Pedicle length** | |
|---|---|
| *Mean±SD* | *15.45 ± 2.21* |
| *Range* | *10-20* |

**Table (8)** showed descriptive statistics pedicle length distribution among study group.

**Table (9):** Functional outcomes evaluated by the QUICKDASH scale.

| Case | QUICKDASH score (% of disability) |
|---|---|
| 1 | 11.5 |
| 2 | 45.5 |
| 3 | 15.6 |
| 4 | 19.5 |
| 5 | 17.8 |
| 6 | 30.3 |
| 7 | 18.2 |
| Mean | 22.6 |

**Table (9)** showed that the QUICKDASH score was (22.6 %) for a 7 cases of upper extremity defects reconstructed by free TDAP. This represents an improvement in the disability, which means common uses of the upper limb could be done.

**Table 10 : TDAP Flaps Functional outcomes evaluated by the lower limb core scale (LLCS).**

| case | Lower limb core scale (LLCS) (%) |
|---|---|
| 1 | 32.1 |
| 2 | 10.7 |
| 3 | 7.1 |
| 4 | 39.3 |
| 5 | 21.4 |
| 6 | 25 |
| 7 | 39.3 |
| 8 | 14.3 |
| 9 | 17.9 |
| 10 | 14.3 |
| 11 | 10.7 |
| 12 | 28.8 |
| 13 | 17.9 |
| Mean | 21.5 |

The final score was calculated by dividing the sum of number of responses over the number of completed responses and then subtracting one and multiplying by 25. This study included 13 TDAP flaps used in reconstruction of lower extremity defects. The functional outcomes of these cases as evaluated by the lower limb core scale (LLCS) was 21.5 as a mean value.

**Table 11: the Vancouver scar scale (VSS) for donor closure by STSG**

| **Case** | the Vancouver scar scale (VSS) for donor closure by STSG |
|---|---|
| 2 | 2 |
| 6 | 5 |
| 9 | 5 |
| 15 | 4 |
| Mean | 4 |

Vancouver Scar Scale (VSS) was used to assess the quality and related problems for the donor site scar.

6 cases (30%) showed donor site scar related problems, where 2 cases of hypertrophic scars (10%) and 4 cases of widened scars (20%) in which the donor site was closed with split thickness graft (STSG) due to flap width exceeding 10 cm. These cases showed the worst scores on the 3 scale.

**Table 12 :** Post-operative aesthetic outcomes according to Likert scale.

| Case | 1st surgeon | 2nd surgeon | 3rd surgeon | patient | Min/Max | Mean | qualification |
|---|---|---|---|---|---|---|---|
| 1 | 12 | 11 | 13 | 10 | 10/13 | 11.5 | Regular |
| | 17 | 18 | 16 | 15 | 15/18 | 16.5 | Good |
| 3 | 4 | 4 | 4 | 4 | 4/4 | 4 | Poor |
| | 16 | 15 | 17 | 14 | 14/17 | 15.5 | Good |
| 5 | 15 | 14 | 16 | 13 | 13/16 | 14.5 | Very good |
| | 18 | 17 | 19 | 17 | 17/19 | 17.8 | Very good |
| 7 | 11 | 10 | 12 | 10 | 10/12 | 10.8 | Regular |
| | 16 | 18 | 17 | 19 | 16/19 | 17.5 | Very good |
| 9 | 16 | 15 | 14 | 16 | 14/16 | 15.3 | Good |
| | 12 | 11 | 10 | 11 | 10/12 | 11 | Regular |
| 11 | 12 | 11 | 11 | 12 | 11/12 | 11.5 | Regular |
| | 17 | 18 | 16 | 17 | 16/18 | 17 | Very good |
| 13 | 12 | 11 | 12 | 10 | 10/12 | 11.3 | Regular |
| | 15 | 16 | 15 | 16 | 15/16 | 15.5 | Good |
| 15 | 7 | 8 | 9 | 8 | 7/9 | 8 | Bad |
| | 15 | 16 | 14 | 14 | 14/16 | 14.8 | Good |
| 17 | 15 | 14 | 14 | 16 | 14/16 | 15 | Good |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **15** | **15** | **16** | **14** | **14/16** | **15** | **Good** |
| 19 | **16** | **17** | **18** | **17** | **16/18** | **17** | **Very good** |
| | **11** | **12** | **13** | **11** | **11/13** | **11.8** | **Regular** |

**Table 13:** Association between comorbidities, smoking and flap outcome:

| | **Total (n=20)** | **Flap Survival (n=17)** | **Flap Failure (n=3)** | **P-value** |
|---|---|---|---|---|
| Smoking | | | | |
| - Smoker | 8 | 6 | 2 | (P < 0.05). |
| - Non-smoker | 12 | 12 | 0 | |

Smoking was significantly associated with higher flap failure/complication rates ($p < 0.05$).

**Discussion:**

In reconstructive microsurgery, the reconstruction of extremities complicated soft tissue lesions remains challenging as flap selection must balance donor site morbidity, operating efficiency, and reliability. Although muscle-sparing benefits have made perforator flaps popular, not all of them perform equally in clinical settings. Despite its theoretical attractiveness, the thoracodorsal artery perforator (TDAP) flap is still technically challenging and may not always yield the best results when compared to other well-established treatments.

In our study, we evaluated operative parameters and surgical outcomes, as well as the true clinical utility of preoperative computed tomography angiography (CTA) in TDAP flap planning. With a 100% correlation between preoperative results and intraoperative perforator identification, CTA showed remarkable anatomical precision; however, this did not result in a quantifiable therapeutic advantage.

The disparity between anatomical accuracy and clinical value has been discussed in recent research, while CTA can provide detailed three-dimensional vascular mapping, several studies have questioned whether this additional information significantly alters intraoperative decision-making or improves outcomes. In a recent systematic evaluation, Rozen et al.(2020)(13) emphasized that although CTA enhances preoperative planning, its routine use does not necessarily reduce operative time or complication rates in all perforator flap procedures.

Despite the use of CTA, surgical parameters, such as ischemia time and perforator dissection time, were substantially protracted in our study. This shows that the limiting aspect in TDAP flap surgery isn't just perforator localization, but the flap's intrinsic technical complexity. The requirement for thorough intramuscular dissection, combined with the tiny diameter and diversity of thoracodorsal perforators, adds greatly to surgical challenges.

One significant limitation in our scenarios is the TDAP perforators' tiny diameter. Smaller-caliber perforators are more vulnerable to thrombosis, vasospasm, and technical damage during anastomosis and dissection. Literature has consistently documented that TDAP perforators are less strong than those of the anterolateral thigh (ALT) flap (14). The anatomical features could help to explain why TDAP-based reconstructions have a greater incidence of complications.

However, challenges with TDAP flaps are shown by the postoperative outcomes in our study, such as wound infection, venous congestion, and complete flap loss. Furthermore, such concerns emerged despite proper preoperative mapping, reinforcing the idea that CTA did not reduce the flap's inherent technical pitfalls. Kim et al. 2022, 7) noted similar results, indicating that perforator-based flaps with smaller vessel calibers correlate to higher rates of vascular compromise.

On the contrary, Wei et al. (2020, 15) and Wong et al. (2021, 16) mentioned that the ALT flap is still considered by many to be one of the most dependable and adaptable choices for extremity repair. Larger and more reliable perforators, a longer vascular pedicle, and comparatively simple dissection are a few benefits of the ALT flap. These elements provide better flap survival rates, shorter operating times, and less ischemia.

In addition, the ALT flap's anatomical symmetry reduces intraoperative complications through more precise surgical preparation. This contrasts with the variability of TDAP perforators, which frequently require surgical modifications and significant dissection. ALT flaps have been favored over conventional perforator flaps because, according to a comparison by Liu et al. 2023 (4), they were related to much shorter operating times and fewer complications.

The impact of operating time and ischemia duration based on flap survival is a crucial factor to take into consideration. One of the major risk factors for flap failure, especially in free tissue transfer, is prolonged ischemia. Flap loss and vascular issues in our study may have been caused by the relatively prolonged ischemia seen in TDAP cases.

This stresses even more how crucial it is to choose flaps that enable effective harvesting and quick anastomosis.

When it comes to the function of CTA, its regular application needs to be carefully considered. Iodinated contrast chemicals, administered as part of CTA, have the potential to cause nephrotoxicity and hypersensitivity reactions. Even though these hazards are usually minimal, they might not be acceptable in situations when non-invasive, alternative methods can yield enough information.

For perforator localization, handheld Doppler ultrasonography is still an accessible and affordable method. Although it may be less precise than CTA, it has been shown to provide adequate guidance in most cases when used by experienced surgeons. Doppler-guided and CTAguided perforator flap planning have shown similar results in recent trials, especially in skilled practitioners (Gacto-Sánchez et al 2021) (1).

Additionally, using sophisticated imaging methods like CTA would not always result in better surgical outcomes. Surgical talent remains the most significant factor for evaluating success due to the dynamic nature of perforator architecture and intraoperative considerations, including vascular spasm and tissue manipulation. In this situation, careful intraoperative examination may yield more favorable outcomes than CTA.

Financial viability is an additional significant factor. CTA may not be appropriate in all cases because it is linked to additional healthcare expenses and resource consumption. Reliance on easier methods, like Doppler, might be more feasible in contexts with limited resources without sacrificing results.

Overall, the results of this study reveal that although CTA is quite accurate in anatomical mapping, its frequent use does not improve surgical efficiency or lower the rate of complications in TDAP flap surgery. However, although being a feasible alternative, the TDAP flap itself has a minor complication profile, longer operating times, and technical obstacles.

The ALT flap, on the contrary, seems to provide a better balance between surgical results, ease of harvest, and reliability. It is an effective option in many reconstructive settings due to its uniform anatomy, wider perforators, and flexibility.

Conclusion:

Within the limitations of the present study, preoperative computed tomography angiography (CTA) demonstrated excellent anatomical accuracy in perforator localization. However, this accuracy did not translate into a significant clinical advantage in terms of operative efficiency or reduction of postoperative complications.

The use of CTA did not result in a noticeable decrease in ischemia time or perforator dissection time, nor did it prevent the occurrence of flap-related complications. Therefore, its routine use in TDAP flap planning appears to offer limited additional benefit compared to simpler and less invasive modalities.

Regarding flap selection, the thoracodorsal artery perforator (TDAP) flap proved to be a viable reconstructive option for extremity soft tissue defects. Nevertheless, it was associated with several technical challenges, including small-caliber perforators, demanding intramuscular dissection, and relatively prolonged operative and ischemia times. These factors may contribute to an increased risk of complications and limit the overall efficiency.

In contrast, evidence from the current literature suggests that the anterolateral thigh (ALT) flap offers more consistent anatomy, larger perforators, easier dissection, and shorter operative time, making it a more reliable and preferable option in many reconstructive scenarios.

Accordingly, while TDAP flaps remain a valid option, they may not represent the optimal first-line choice in all cases, particularly when alternative flaps with more favorable anatomical and technical characteristics are available.

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