recently, vascularized transfer has improved graft survival, with adequate perfusion enabling increased growth. The aim of this study was to compare the indications, techniques, and outcomes of vascularized and nonvascularized toe-to-hand transfer surgery in patients with congenital hand differences.

**METHODS:** A systematic review was conducted according to PRISMA guidelines. Studies containing data on indications, surgical technique, and outcomes for patients with congenital absence or deficiency of digits or thumb treated with toe-to-hand transfer were included. Confidence intervals (CI) were calculated for outcomes of the two toe transfer techniques. Failure was defined as resorption of the graft or necrosis necessitating removal. The 95% CIs were used to determine difference in outcomes. Statistical significance was determined using a chi-square test.

**RESULTS:** Forty studies published between 1978 and 2020 were included, containing 534 patients and 866 transfers. Twenty-three studies (58%) described only vascularized/microsurgical toe-to-hand transfers, 15 (38%) described nonvascularized, and 2 (5%) included patients with both.

There were 133 men (53.4%) and 116 (46.6%) women. Three hundred nineteen patients (59.7%) had vascularized transfers, 214 (40.1%) nonvascularized, and one had both (0.2%). The mean age for vascularized transfers was 2.5 years (range 6 months–17 years) and 3.1 years (range 6 months–22 years) for nonvascularized. Follow-up for the vascularized group was 4 months to 11 years and 6 months to 35 years in the nonvascularized group.

Symbrachydactyly was the most common indication in both groups (46.3%, 45.3%). The most commonly transplanted vascularized toe was the second one (91.5%). The fourth toe was most commonly used in the nonvascularized group (61.9%). Vascularized toe transfers were most commonly used to reconstruct the thumb (53.3%) or unspecified fingers (25.9%). The thumb was also most commonly reconstructed in nonvascularized transfers (30%), followed by the middle (19.2%), ring and pinkie (17.8% each), and index finger (14.6%).

In cases where hands were bilaterally affected, most often one vascularized toe was transferred to each affected hand (74%, second toe in 88% of these). For bilaterally affected patients in the non-vascularized group, 60% had one transfer to each hand (fourth and fifth toes preferred).

Vascular complications were most common after vascularized transfers, occurring in 6.8% of transfers, though 94.7% of these were ultimately successful after reoperation. Resorption accounted for most complications after nonvascularized transfers, with a 12.6% resorption rate. The resorption rate was 0.7% in the vascularized group. Instability occurred after 5.6% of nonvascularized transfers and 0.7% of vascularized. Vascularized toes showed better healing, range of motion, and growth. In the vascularized group, there was a higher success rate of 98.6% (95% CI 97.4%–99.7%). The nonvascularized group had a success rate of 86.8% (95% CI 83.6%–90%), ($P < 0.001$).

**CONCLUSIONS:** Both toe transfer techniques are good options for reconstruction of congenital absence or deficiency of digits or thumb. Our study found a higher success rate in vascularized compared with nonvascularized transfers. Indications and approach for each technique varied among patients treated by the same author.

**The Effects of Skin Surface Temperature Change on Capillary Blood Flow using Video-capillaroscopy**

**Presenter:** Chihiro Matsui, MD

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**INTRODUCTION:** Video-capillaroscopy (VC) is widely used to observe nail capillary changes in patients with collagen diseases. In recent years, VC continues to improve and now allows real-time observation of red blood cell movements in capillaries at a depth of 1 mm from the skin surface. This device could be used for various clinical scenarios such as monitoring blood flow in flaps, replanted fingers, skin grafts, and keloids.

It is known that skin capillaries can contract during skin cooling, but the details of capillary changes under video-capillaroscopy observation are not known. By investigating the changes in skin capillaries during cooling using VC, it will be possible to compare the effects of temperature on skin capillaries with those at room temperature and establish temperature criteria for future VC applications.
Therefore, we observed and compared VC findings on skin areas often used for flap harvest at a normal body temperature and at a lower temperature.

**METHODS:** Twenty healthy Japanese adults were included in the study. Skin capillaries were observed at lateral thigh, forearm, mid-axillary line, abdomen, and the fingertip using VC (GOKO Bscan-Z), and the findings were recorded for 3 minutes before and after cooling. Ice packs were used to lower the skin temperatures to less than 35°C. By using ImageJ software, we measured the total blood vessel area (by pixels) per visual field, and this number was then divided by the area of the entire visual field (by pixels) to define the percentage of mean blood vessel area (%) for all visual fields. The blood flow velocity (μm/s) was measured using GOKO-VIP software, and the results for both temperatures were then compared.

**RESULTS:** According to the Fitzpatrick skin typing (FST), 11 people were type II, 5 people were type III, and 4 people were type IV. The amount of melanin pigmentation in the skin correlated with the difficulty of capillary observation. Mean skin temperature before cooling was 36.4 ± 0.2°C and 34.5 ± 0.8°C after cooling. Capillary red blood cell movements were captured at all observation points.

From normal temperature to cooling temperature, the mean blood vessel area reduction rates (%) were 63.0% for the lateral thigh, 30.0% for the forearm, 43.3% for the mid-axillary line, 34.9% for the abdomen, and 64.9% for the fingertip.

When comparing normal temperature to cooling temperature, the blood flow velocity (μm/s) reduction rates (%) were 75.7% for the lateral thigh, 55.3% for the forearm, 68.9% for the mid-axillary line, 61.6% for the abdominal skin, and 79.2% for the fingertip after cooling. All comparisons were significantly different with \( P < 0.001 \).

**CONCLUSIONS:** Decrease in skin surface temperature resulted in capillary vasoconstriction and a decrease of capillary blood flow velocity in all areas. When VC is used for flap monitoring, it is important to keep the observation area warm because temperature decrease in the monitored area might result in the false diagnosis of arterial occlusion.

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**A 20-year Analysis of Medicare Reimbursement for Abdominal Wall Reconstruction (2000–2020)**

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**PURPOSE:** Lack of financial data regarding procedural reimbursement trends in abdominal wall reconstruction was identified. Analysis of such trends is important to understand the sustainability of current reimbursement models and to ensure adequate reimbursement for reconstructive surgeries moving forward. The purpose of this study was to evaluate monetary trends in Medicare reimbursement rates for 30 abdominal wall reconstruction surgical procedures over a 20-year period (2000–2020).

**METHODS:** The Physician Fee Schedule Look-Up Tool from the Centers for Medicare & Medicaid Services was utilized for each of the 30 included current Procedural Terminology (CPT) codes, and reimbursement data were extracted. The list of CPT codes was compiled prior to data collection in order to ensure a representative and comprehensive analysis of commonly utilized procedural codes. Monetary data were adjusted for inflation to 2020 US dollars utilizing changes to the United States consumer price index. The R-squared, average annual percent change and average total percentage change in reimbursement were calculated based on these adjusted trends for all included procedures.

**RESULTS:** After adjusting for inflation, the average reimbursement for all procedures decreased by 17.8% from 2000 to 2020. The greatest mean decrease was observed for CPT code 49568 (the implantation of mesh or other prosthesis for open incisional or ventral hernia repair or mesh for closure of debridement for necrotizing soft tissue infection, −34.4%). The only procedure with an increased adjusted reimbursement rate throughout the study period was CPT code 20680 (+3.9%). From 2000 to 2020, the adjusted reimbursement rate for all included procedures decreased by an average of 0.88% each year, with an average \( R^2 \) value of 0.80, indicating a stable decline throughout the study period.

**CONCLUSIONS:** After adjusting for inflation, there has been a steady decline in Medicare reimbursement for the included procedures from 2000 to 2020. Increased awareness of these trends by surgeons, hospitals, and policy