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INTRODUCTION: Recent estimates suggest there are at least 25 million transgender people worldwide. Up to 0.9% of the US population is thought to express some form of gender dysphoria. Medical and surgical gender confirmation has been proven to have a substantial impact on transgender patients’ physiologic and psychosocial outcomes along with improved quality of life. Yet, little is known about the quality of life outcomes after facial feminization surgery (FFS). The purpose of this study was to examine the quality of life outcomes after FFS.

METHODS: A multi-center prospective cohort study was implemented and enrolled patients over the age of 18 from two institutions who were planning to undergo FFS. Subjects were asked to complete a previously validated instrument for assessment of quality of life outcomes after FFS and have clinical photographs at pre-determined intervals: pre-operatively, 1 week to 1 month post-operatively, and greater than 6 months post-operatively. An FFS outcome score was calculated at each interval with a range from 0 – 100, and photos were analyzed through facial analysis. Patient demographic data was obtained. Non-parametric unpaired Mann-Whitney test was used for statistical analysis.

RESULTS: Fifteen patients have been enrolled with an average age was 34.5 years and less than a third of patients had a smoking history. All subjects had begun medical transition with hormone therapy while 50% had previous gender-confirming surgery and 15.4% had previous FFS. Most patients had begun their transition over one year ago. The mean pre-operative FFS outcome score was 48.3 ± 15.4 which improved to 86.9 ± 13.2 at < 1 month post-operatively (p=0.0002 vs pre-op) then 89.8 ± 8.7 at > 6 months post-operatively (p=0.0004 vs pre-op; p=0.66 vs 1 month). Subjects reported being very satisfied (mean = 3.7 ± 0.5) with the outcomes of their FFS on a four-point Likert scale (0=least satisfied, 4=most satisfied) at > 6 months post-operatively. Facial analysis showed substantial changes in facial properties.

CONCLUSION: FFS has a significant positive impact on transgender patient quality of life with minimal complications. More patients are continually being enrolled in this study, but these preliminary results and previous research points to the medical necessity of FFS for transgender patients.

Applying State of the Art 3D Technology in the Separation of Conjoined Twins

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INTRODUCTION: The successful separation and reconstruction of craniopagus twins is a technically demanding procedure that necessitates comprehensive and precise pre-operative planning. The three key challenges include (1) separating complex vascular anatomy without precipitating hemodynamic collapse (2) dividing shared brain matter without compromising critical tissue, and (3) reconstructing the dura, bony skull and soft tissue scalp using limited autologous materials. Virtual surgical planning (VSP) combines 3D-modeling and simulation software for the purpose of precisely planning such complex surgeries. Customized guides and jigs can be designed during the digital planning sessions based on high-fidelity anatomical models. These tools can then be 3D-printed, sterilized, and applied to the patient in the operating room to facilitate the precise translation of virtual plans into reality. Our goal was to utilize this technology in the separation and reconstruction of craniopagus twins.

METHODS: The twins underwent initial CT and MRI angiography and venography prior to any surgery to evaluate their arterial and venous anatomy as well as the brains. 3D photographs (Canfield Vectra H1) of the twins were also taken. Repeat imaging was performed subsequent to each of the first three stages of surgery.

Based on these data, our team used VSP and 3D-printing to design and 3D print (1) osteotomy guides that minimized surgical risk by avoiding underlying vasculature and which generated portions of cortical bone that could be optimally repurposed for skull reconstruction and (2) age
and size-matched normative skull-caps to serve as a template for the shape of the reconstructed skull. VSP was also used to plan incisions, skin flaps, and tissue expansion. In addition, 3D printing was used to produce intraoperative reference models highlighting the neurovasculature and brain tissue.

RESULTS AND CONCLUSION: The challenge of craniopagus separation is due to the complexity of the venous plexus and shared dural venous sinus. Therefore, separation of the venous system of the twins requires meticulous planning and stereoscopic appreciation of the vasculature. Both VSP and 3D printed models were critical as references of the venous anatomy during separation and to the survival of both twins. VSP and 3D printing were also employed successfully in predicting the scalp and skull defects and designing custom guides and jigs which were used intraoperatively and facilitated surgical reconstruction.

HAND SESSION 2

Hand Transplantation in Patients with Extensive Burns of the Upper Extremities: Anatomical Study on Feasibility

Presenter: Edoardo Dalla Pozza, MD
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INTRODUCTION: Hand transplantation in patients with severe burns of the upper extremity presents unique challenges because of extensive skin and soft tissue deficit. In skin grafted recipient limbs there is an increased risk of exposure of vascular anastomosis, tendons and nerves. The aim of this anatomical study was to evaluate how to reliably transfer increased amounts of skin from the upper extremity based on the perforators of the main axial vessels to replace the scarred recipient skin.

METHODS: 25 upper limbs were studied. Based on the vascular anatomy of the perforators, forearm based hand allografts were harvested with 3 different patterns: A) volar and dorsal forearm flaps based only on distal perforators of Radial (RA), Ulnar (UA) and Posterior Interosseous (PIA) arteries and islanded medial arm flap based on Brachial and/or Superior Ulnar Collateral (SUCA) arteries; B) volar and dorsal forearm flaps with preservation of proximal RA perforators with only distal UA perforators and the islanded medial arm flap C) dorsal forearm flap and extended medial arm-volar forearm skin flap.

16 samples were injected with latex to map the perforating branches of the BA, SUCA, RA, UA and PIA. 3 samples for each group were dissected and injected with blue ink from the proximal BA to assess the retained perfusion of the flaps.

RESULTS: The medial arm flap was constantly supplied by perforators from the BA and the SUCA (respectively 4.35±1.64, diameter 1.03±0.34mm and 2.6±0.76, diameter 0.90±0.34mm) and adequately perfused when the perforators from the BA or SUCA were preserved (90.8% stained). Perforators from RA (9.3±1.62) if preserved, proved to be adequate to supply the total volar forearm skin (87.6% stained). The harvesting of the PIA with its perforators (5.25±0.95) provided vascularization to the proximal half of the posterior flap.

CONCLUSION: The medial arm flap should be safely based on perforators from the BA and/or SUCA. The design of the specimens in group B proved higher vascularization reliability and versatility as they provided adequate vascularization to the skin flaps with minimal interference with the dissection and repair of vessels, tendons and nerves.

Distal Phalanx Replantation Using Delayed Venous Repair

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