Pediatric facial burns: Is facial transplantation the new reconstructive psychosurgery?

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INTRODUCTION: Current pediatric burn care has resulted in survival being the expectation for most children. Composite tissue allotransplantation in the form of face or hand transplantation may present opportunities for reconstructive surgery of patients with burns. The present paper addresses the question "Could facial transplantation be of therapeutic benefit in the treatment of pediatric burns associated with facial disfigurement?"

METHODS: Therapeutic benefit of facial transplantation was defined in terms of psychiatric adjustment and quality of life (QOL). To ascertain therapeutic benefit, studies of pediatric burn injury and associated psychiatric adjustment and QOL in children, adolescents and adults with pediatric burns, were reviewed.

RESULTS: Pediatric burn injury is associated with anxiety disorders, including post-traumatic stress disorder and depressive disorders. Many patients with pediatric burns do not routinely access psychiatric care for these disorders, including those for psychiatric assessment of suicidal risk. A range of QOL outcomes were reported; four were predominantly satisfactory and one was predominantly unsatisfactory.

DISCUSSION: Facial transplantation may reduce the risk of depressive and anxiety disorders other than post-traumatic stress disorder. Facial transplantation promises to be the new reconstructive psychosurgery, because it may be a surgical intervention with the potential to reduce the psychiatric suffering associated with pediatric burns. Furthermore, patients with pediatric burns may experience the stigma of disfigurement and psychiatric conditions. The potential for improved appearance with facial transplantation may reduce this 'dual stigmata'. Studies combining surgical and psychiatric research are warranted.

Key Words: *Pediatric facial burns; Psychiatry; Quality of life*

Today's advanced pediatric burn care has resulted in survival being the expectation for most children (1). In parallel with such advances in pediatric burn care have been advances in composite tissue allotransplantation (CTA). CTA in the form of face and hand transplantation may present new opportunities for reconstructive surgery of patients with burn injuries (2). Pediatric burns of greater than 30% total body surface area (TBSA) commonly include the face or hands with accompanying serious disfigurement and disability (3). For many patients with such burns, their associated altered appearance may be a key factor in psychological and social adjustments following burn injury (4). Furthermore, poor adjustment secondary to altered appearance is commonly unrecognized and untreated (4). Could CTA and facial transplantation be of therapeutic benefit for the treatment of pediatric burn injury

Brûlures au visage chez l'enfant : La transplantation faciale est-elle la nouvelle psychochirurgie reconstructive?

INTRODUCTION : Le traitement actuel des brûlures chez l'enfant génère comme attente la survie dans la plupart des cas. L'allotransplantation tissulaire composite sous forme de greffe du visage ou de la main peut offrir des possibilités de chirurgie reconstructive chez les patients victimes de brûlures. Le présent article tente de répondre à la question : « La transplantation faciale pourrait-elle comporter des avantages thérapeutiques pour le traitement des brûlures associées au défigurement chez l'enfant? ».

MÉTHODES : L'avantage thérapeutique de la greffe faciale a été défini sur les plans de l'adaptation psychiatrique et de la qualité de vie. Pour en vérifier les bienfaits thérapeutiques, les auteurs ont passé en revue des études sur les brûlures infantiles et l'adaptation psychiatrique et la qualité de vie qui y sont associées chez les enfants, les adolescents et les adultes ayant subi des brûlures durant l'enfance.

RÉSULTATS : Les brûlures infantiles sont associées à des troubles anxieux, y compris au syndrome de stress post-traumatique et à des troubles dépressifs. De nombreux patients ayant subi des brûlures durant l'enfance n'ont pas eu accès d'emblée à des soins psychiatriques pour ces types de problèmes, comme une évaluation psychiatrique du risque suicidaire. Divers rapports ont été présentés sur des paramètres liés à la qualité de vie. Quatre ont été surtout favorables et un, surtout défavorable.

DISCUSSION : La greffe du visage peut réduire le risque de troubles dépressifs et de troubles anxieux, autres que le syndrome de stress post-traumatique. En tant qu'intervention chirurgicale susceptible de réduire la souffrance morale associée aux brûlures subies durant l'enfance, la transplantation faciale pourrait devenir la nouvelle psychochirurgie reconstructive. En outre, les patients ayant subi des brûlures durant l'enfance peuvent souffrir de stigmatisation due à la fois au défigurement et aux troubles psychiatriques. La possibilité d'améliorer l'apparence grâce à la greffe du visage pourrait réduire cette « double stigmatisation ». D'autres études sur les composantes chirurgicale et psychiatrique du traitement s'imposent toutefois.

associated with serious facial disfigurement? CTA has been used in pediatric surgery with lower limb transplantation between conjoined twins (5) and single hand transplantation between identical twins (2). However, this surgical experience with CTA does not readily translate to the pediatric burn context and facial transplantation. Therefore, to address our paper's question, we have reviewed published literature regarding pediatric burn injury and associated psychiatric adjustment and quality of life (QOL) in children, adolescents and adults with pediatric burns, to ascertain the potential for therapeutic benefit of facial transplantation.

METHODS

The therapeutic benefit of facial transplantation has been defined in terms of psychiatric adjustment and QOL. The pediatric burn

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injury and associated QOL literature was selected for review because QOL is a multidimensional and comprehensive measure of health, which has become recognized as an important pediatric health care outcome (6). To ascertain the potential for therapeutic benefit, two categories of pediatric burn injury literature were reviewed: pediatric burn injury and associated psychiatric adjustment in children, adolescents and adults with pediatric burns; and pediatric burn injury and associated QOL in children, adolescents and adults with pediatric burns.

RESULTS

Pediatric burns and psychiatric adjustment

Stoddard et al (7,8) investigated psychiatric diagnoses among pediatric patients with burns and a matched pediatric population from a health maintenance organization (HMO) (7), and compared studies of children of depressed parents, childhood survivors of floods and a community sample of adolescents 14 to 16 years of age (8). In the former study, 63% of patients had moderate to very severe cosmetic disfigurement. Pediatric patients with burns had significantly higher lifetime rates of anxiety disorders (such as overanxious disorder and phobias) and enuresis, and similar current rates of depressive disorders when compared with a matched group of HMO patients (7). In addition, approximately 25% of the pediatric patients with severe burns experienced the full diagnostic syndrome of post-traumatic stress disorder (PTSD) (lifetime) (7). Stoddard et al (8) further reported that 53% of patients experienced full or partial lifetime PTSD diagnoses, and 73% experienced some form of lifetime depressive disorder. In comparison with studies of children of depressed parents, childhood survivors of floods and a community sample of adolescents 14 to 16 years of age, pediatric patients with burns had high rates of anxious disorders (overanxious disorders and phobias), enuresis and enco-
 prepsis (8). The rate of major depression was similar between a sample of pediatric burn patients and children of depressed parents; in addition, conduct disorder was elevated for the samples of burn-injured and flood-traumatized children (8). Furthermore, the mean number of psychiatric diagnoses was significantly associated with burns of TBSA greater than 30% and parental history of emotional problems (8). Burn-related factors hypothesized to be contributory to psychiatric disorders included facial disfigurement for depression, multiple surgeries for anxiety, multiple needles for specific phobia plus scars, and associated social rejection for social phobia (7). Stoddard et al (7) described limitations affecting these study findings: patients in the matched HMO sample subgroup may have had an elevated risk of depression, and the prevalence of depression and anxiety may have been underestimated because study non-participants may have included patients with these conditions. In addition, during their study, Stoddard et al (8) identified and referred a subgroup of patients, some with current suicidal ideation for mental health care. Periodic psychiatric care, including re-evaluation and treatment, was recommended for pediatric patients with burn injuries and their families.

Landolt et al (9) completed a diagnostic study regarding PTSD in children with burn injury. This study sample included 44.2% (n=19) of patients with facial burn involvement. PTSD was diagnosed in 18.6% of children, with 55.8% of children reporting the PTSD re-experiencing symptom cluster, 25.6% reporting the PTSD avoidance cluster and 44.2% reporting the

PTSD arousal cluster. PTSD was not associated with facial involvement, TBSA, grafting procedures or length of hospitalization. One reported reason for study nonparticipation was children's reluctance to recount their burn history. This explanation for study nonparticipation was suggestive of PTSD avoidance symptomatology; therefore, the reported study prevalence of PTSD may be low.

The Shriners group from Galveston, Texas, USA, have published a series of follow-up studies regarding adults with pediatric burns during the transition from adolescence to young adulthood. The study investigated patients currently 18 to 28 years of age who had suffered burns before the age of 16 years. Patients had burns with TBSA greater than 30%; most patients had significant facial scarring, and many had digit or hand amputations (3). In the Shriners Hospital system, all patients are provided coordinated inpatient and outpatient care until 21 years of age, including medical, mental health and rehabilitation care. This model has been described as an ideal continuum of burn care (10). The Galveston follow-up studies directly related to psychiatric adjustment included two studies: one regarding psychiatric diagnoses (3) and one regarding suicide potential (11).

Meyer et al (3) investigated the prevalence of psychiatric disorders among young adults with pediatric burns. Psychiatric diagnoses were assessed by means of the Structured Clinical Interview (SCID) for the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition (DSM-IV). The SCID is considered to be the gold standard for research psychiatric diagnoses. For this study, prevalence rates of psychiatric diagnoses were compared across this burn population and three national studies: the Epidemiological Catchment Area Study (ECA), the National Comorbidity Survey (NCS) and the National Comorbidity Survey Replication (NCS-R). Significant pediatric burn injury was associated with increased risk of developing an adult psychiatric disorder. The prevalence of any psychiatric disorder was 45.5% (current) and 59.4% (lifetime). Female sex was significantly associated with higher rates of any current psychiatric disorder. Burn and demographic characteristics were not significantly associated with prevalence of adult psychiatric disorders. The predominant psychiatric disorders in order of frequency were anxiety (including PTSD), affective, and alcohol and/or substance abuse/dependence disorders. Anxiety and affective disorder rates were generally higher in the burn population than in the three national surveys (matched for age). Importantly, of those burn patients reporting current depression, only one received therapy, and for those adults reporting past depression, severe adolescent depressions were common. In addition, for patients with PTSD, some experienced recurrences secondary to ongoing losses in their lives. The authors noted that current burn care and mental health care resources may not be sufficient to address the therapeutic needs of the potential numbers of adults with psychiatric conditions and the range of conditions identified in this study. Furthermore, it was noted that general mental health practitioners may not possess the prerequisite skills for identification of psychiatric morbidity among young adults with pediatric burns; anxiety disorders – the most commonly identified conditions – are not commonly considered serious psychiatric conditions.

Rosenberg et al (11) investigated the suicide probability of young adults with pediatric burns. The study measure of

suicidality was the Suicide Probability Scale (SPS). The SPS manual provided three reference groups for comparison: normal controls, psychiatric inpatients and past suicide attempters. Adults with pediatric burns identified more hopelessness than the SPS normal control reference group. Twenty-six per cent of study participants had SPS scores greater than one SD from the mean, indicative of moderate concern regarding suicidality. Six per cent had SPS scores greater than two SDs from the mean, indicative of moderate-severe concern regarding suicidality. For this latter group, three adults had major depression, one had PTSD and one was alcohol-dependent. At the time of this study, this latter group was referred to mental health professionals for treatment, including for one individual implementation of suicide precautions. Rosenberg et al (11) reported that many young adults with pediatric burns may be at moderate risk according to the SPS for expression of suicidal ideation and behaviour. Furthermore, for those young adults with SPS scores of one or more SD above the mean, mental health, professional assessment and potential treatment are indicated. Burn care professionals were recommended to be more vigilant in assessing patients in follow-up for suicidality because these patients may be reluctant to independently seek out mental health care. Therefore, suicidality may not only be a serious psychiatric morbidity associated with past pediatric burn injury, but may also be a hidden psychiatric morbidity. These study findings attest to both a serious and hidden burden of psychiatric suffering for young adults with pediatric burns.

Pediatric burns and QOL

Sheridan et al (12) evaluated long-term outcomes of children with massive burn injuries (TBSA of greater than 70%) by using the Short Form 36 (SF-36), a QOL measurement tool. The SF-36 has eight measurement domains, with the mental health domain measuring depression, anxiety and psychological well-being. Because these were massive burns, virtually all children suffered face or hand burns. Sheridan et al (12) reported that although pediatric patients with massive burns cannot be returned to preburn appearance and function, QOL as measured by the SF-36 was comparable with that of the age-matched general population. Family functioning, early reintegration and consistent burn aftercare attendance was correlated with a range of positive SF-36 domain scores. With respect to the SF-36 mental health domain outcome, patients had improved scores on this domain ($P=0.02$) in comparison with the general population. The SF-36 mental health domain was not correlated with those variables noted above that were correlated with positive SF-36 domain scores. However, a small patient subset had continued physical or mental health problems. This subset scored greater than two SDs below the relevant domain norms – 20% ($n=12$) for physical role, 15% ($n=9$) for physical functioning and 5% ($n=3$) for mental health. Furthermore, one patient was not included in this study because this patient survived his or her burn but subsequently was believed to have committed suicide seven years later. Although the cause of this suicide was unknown, it was believed to be related to a burn-related depression. The SF-36 identified a range of patient adjustments on the mental health domain, with most patients reporting satisfactory adjustment and a small subset reporting significantly less satisfactory adjustment, perhaps indicative of serious mental health problems.

Specific limitations associated with the SF-36 measurement were itemized by Sheridan et al (12). The SF-36 is a generic measurement instrument without specificity for evaluating the impact of appearance on QOL. However, Sheridan et al (12) believed that the impact of appearance on psychological state, such as mood, would be captured with the SF-36 mental health domain score. In addition, although increasing TBSA was associated with decreased physical function, the specific impact of hand and facial burns could not be evaluated because most patients had such involvement.

Landolt et al (13) evaluated QOL in pediatric patients with burns using the QOL measurement tool TNO-AZL Questionnaire for Children's Health-Related Quality of Life (TACQOL) parent form. The TACQOL has five health status domains and two general mood domains. Landolt et al (13) reported QOL (according to parental report), irrespective of burn variables, to be within normal range. More specifically, visibility of scars (head, neck or hands) was not predictive of QOL (parental report). However, according to the parental report, children demonstrated less satisfactory QOL with regard to the positive emotions QOL domain. Landolt et al (13) considered advances in burn care, which may now produce excellent functional outcomes as well as 'highly satisfactory cosmetic outcomes', as a possible explanation for the lack of correlation between burn variables and QOL. In addition, the limitation of parental proxy report in QOL measurement was noted. Landolt et al (13) reported that their QOL findings suggest that QOL may be domain-specific, and that continued development of pediatric burn-specific QOL measurement tools that included specific evaluation of the impact of facial disfigurement on QOL, is needed. In a more recent study, Landolt et al (9) reported on the association between PTSD and QOL. The same QOL measure was used in this more recent study, but it was the child report form. Child and adolescent QOL was satisfactory in comparison with healthy population norms, except for the QOL domain of social function. PTSD and QOL were negatively correlated, with increased PTSD symptoms associated with poorer QOL across physical, cognitive, motor and emotional function. Furthermore, as reported for PTSD, there was no correlation between QOL and facial burns.

Pope et al (14) evaluated QOL, mood and body image in pediatric patients with burns. The QOL measurement tool used was the Youth Quality of Life Instrument, which measures sense of self, social relationships, environment and general QOL. QOL was compared among pediatric burn patients and a school sample matched for age. Pope et al (14) reported satisfactory QOL for most pediatric patients with burn injury evaluated on average approximately 12 years after the burn injury. Overall, QOL and TBSA were correlated, with increasing TBSA being associated with poorer overall QOL. Pope et al (14) noted some caution in interpretation of study findings due to potential sampling bias.

As noted, the Shriners group from Galveston, Texas, have published a series of follow-up studies regarding adults with pediatric burns. The QOL studies (10,15) are reviewed below.

Rosenberg et al (15) used the Quality of Life Questionnaire (QLQ) measure. The QLQ posits that specific behaviours reflect a good QOL and, therefore, evaluates behaviours instead of thoughts and feelings. The five major QOL domains

include general well being, interpersonal relations, organizational activity, occupational activity, and leisure and recreational activity. Rosenberg et al (15) identified a lower overall QOL in adults with pediatric burns than in the QLQ's reference comparison group. However, for the QOL domain related to friendships, adults with pediatric burns rated greater satisfaction than the reference group. This was a counterintuitive result because a psychiatric diagnostic study of this sample had identified a high prevalence of anxiety disorders, including social phobia (3), which is associated with reluctance to participate in social interactions. Rosenberg et al (15) considered the QLQ measure to be a more sensitive QOL measure for populations of adults with pediatric burns given its evaluation of behavioural response across different environmental contexts. Anxiety disorders were hypothesized to be contributory to this lower QLQ rating (10).

Baker et al (10) reported on assessment of physical disability and activities of daily living for the previously described Galveston burn sample, and on correlation with psychiatric and QOL data. For this study, two QOL measures were used: the SF-36 and the QLQ (both measures have been previously described in this paper [12,15]). In addition, the same diagnostic measure as described previously for Meyer et al (3) was reported. The current psychiatric diagnostic data were not correlated with the physical assessment and activities of daily living outcomes. The QLQ outcome for this study was as reported above (15). The SF-36 outcomes were comparable with the reference comparison group. Physical status was not reported to be related in a clinically significant manner to the QLQ outcomes for adults with pediatric burns. Anxiety disorders were hypothesized to be contributory to the lower QLQ ratings; however, a similar impact of these anxiety disorders was not reflected in SF-36 QOL outcomes. The differences between the QOL outcomes for the SF-36 versus the QLQ were identified as in need of further investigation.

DISCUSSION

Literature regarding psychiatric adjustment and QOL associated with pediatric burn injury has been reviewed to ascertain the potential for therapeutic benefit in the use of facial transplantation for pediatric facial burns. A common theme regarding the limits of current reconstructive surgery in pediatric burn care was voiced in some of the QOL studies: "Children who survive massive burns will have major cosmetic and functional impairments that can never be completely corrected" (12) and "excellent functional results and at least highly satisfactory cosmetic results in the vast majority of cases given optimal care" (13). CTA may present a reconstructive surgical alternative for improved facial reconstruction for patients with burn injury in comparison with current surgical reconstructive techniques (2).

The primary psychiatric diagnostic categories associated with pediatric burn injury include anxiety and depressive disorders. Anxiety disorders include generalized anxiety disorder, PTSD, social phobia and specific phobia. The acute pediatric burn context with concomitant pain, parent stress and separation anxiety, dissociation, severe burn trauma and traumatic memory consolidation appears to be of etiological significance for the development of PTSD (16-20). Furthermore, Landolt et al's (9) study did not find a correlation between PTSD and

facial burns. Facial transplantation would be used as a reconstructive surgical technique subsequent to this acute burn context and the time period in which these putative etiological factors are active. The potential benefit of facial transplantation would not therefore appear to rest in decreasing the risk of PTSD for patients with pediatric burns. However, Stoddard et al (7) hypothesized that a range of burn-related factors may be contributory to anxiety and depressive disorders, facial disfigurement for depression, multiple surgeries for anxiety, multiple needles for specific phobia plus scars, and associated social rejection for social phobia. These hypothesized etiological factors may exert their influence on a long-term developmental basis and are not exclusively associated with the acute burn context. Therefore, the potential benefit of facial transplantation as a reconstructive surgery may be in relation to amelioration of disfigurement and decreased surgeries and hospitalizations. Sheridan et al (12) considered the impact of appearance on QOL to be measured by means of the mood component of the SF-36 mental health domain. This impact may have been reflected in the study's subgroup of patients reporting serious problems on the SF-36 mental health domain. In addition, although long-term psychiatric follow-up identified the high prevalence of anxiety and depressive disorders, an evaluation of the impact of facial burns and disfigurement was not completed (3). The QOL domain of social functioning has also been identified as poor for pediatric patients with burns, and although suggestive of the social impact of disfigurement, it was not correlated with facial burns (9). In contrast, adults with pediatric burns scored higher on a QOL domain related to friendships than the comparison group despite the high prevalence of anxiety disorders, such as social phobia, within this population (3,15). The potential therapeutic benefit for facial transplantation may relate to reducing the risk of depressive and anxiety disorders (other than PTSD), but robust evidence for this benefit awaits future research.

The psychiatric adjustment studies identified that some patients with burn injury – whether children, adolescents or adults with pediatric burns – did not receive psychiatric care in the face of suffering with psychiatric conditions. The most graphic example of this therapeutic travesty was the study regarding suicide potential among adults with pediatric burn injury (11). This absence of psychiatric/mental health care for patients in the face of serious suicidality is of major concern. Rosenberg et al (11) described problematic access to mental health care as a barrier to patients' participation in psychiatric/mental health care. We propose an additional barrier: the hypothetical influence of a 'dual stigmata' for patients with burns with accompanying psychiatric conditions. This potential dual stigmata would be reflective of the stigma associated with both disfigurement and psychiatric conditions. To address this dual stigmata and associated patient reluctance to participate in psychological treatments, the Internet has been considered for the delivery of cognitive behavioural therapy (4). Innovative CTA reconstructive surgical techniques such as facial transplantation may also warrant consideration as a means to address this dual stigmata. As previously described, facial transplantation and enhanced facial appearance may (hypothetically) not only decrease the risk of anxiety and depressive disorders, but also increase the likelihood of patient participation in psychiatric and mental health care.

The QOL studies reviewed used a range of generic QOL measures. A range of QOL outcomes were reported; four were predominantly satisfactory (9,12-14) and one was predominantly unsatisfactory (15). These differences may, in part, reflect different measurement methods, as commented by Baker et al (10) on the discrepant outcomes between the SF-36 and the QLQ within the same study population. In addition, the Landolt et al (13) study highlighted the importance of QOL domains for the interpretation of QOL. This is important to the interpretation of Sheridan et al's (12) study, because overall QOL was satisfactory as measured by the SF-36; however, the mental health domain identified a range of mental health adjustments, with most patients reporting satisfactory mental health adjustment but a small subset reporting significantly less satisfactory adjustment – perhaps indicative of serious mental health problems. Identification of QOL 'at-risk' subgroups may be important to evaluating the therapeutic role that facial transplantation may have as a reconstructive technique for patients with pediatric burns. Plastic surgery-specific QOL measures are lacking (6). The generic QOL measures used in these reviewed studies enabled outcome assessment across different population groups; however, these measures may have lacked sensitivity to the particular concerns of patients with pediatric facial burns. Development of a specific QOL measure for this plastic surgery patient group would optimally include developmental considerations and patient input (6). To encompass these two factors in the development of a specific QOL measure for patients with pediatric facial burns, it would be necessary to include patients from across the lifespan (children, adolescents and adults with pediatric burns) in this process. Future research development of such a specific QOL measure is necessary to more specifically assess the needs of patients with pediatric facial burns.

Two Shriners groups (Boston [Massachusetts, USA] and Galveston) investigated populations with major burn injury. The Boston group investigated a patient population with TBSA of greater than 70% with virtually all patients having face or hand burns. The Galveston group investigated a patient population with TBSA of greater than 30%, with most patients having significant facial scarring and many with digit or hand amputations. Neither group reported on an independent contribution of facial involvement to QOL or psychiatric adjustment. However, it is likely that candidates for facial transplantation may come from populations of major burn-injured patients, such as these two. The context of multiple injury sites may therefore distinguish the burn injury context and facial transplantation from the acute isolated facial injury context and facial transplantation. This context of major pediatric burn injury with not only face but other burn injury sites, such as the hand, generates the question: "Should one consider combination CTA transplantation of face and hand when such a burn-injury context arises?" Consideration of face and hand transplantation in pediatric burns warrants consideration given the meta-analysis of Noronha and Faust (21), which reported on the contributions of a range of variables to postburn psychiatric and psychological adjustment. Body location, which may have operated via pain and functionality was the primary variable, with burn injury factors and visible scarring being additional variables.

A significant limitation of the present review was the paucity of reviewed papers with data specifically related to facial burns, psychiatric adjustment and QOL. Our specific intent

was to evaluate QOL, psychiatric adjustment and facial burns, but only one study group (9,13) provided data specific to that question. In addition, two study groups (the Shriners Hospitals of Galveston and Boston) authored seven of the 10 articles reviewed for the present paper. This work is commendable but as the authors themselves described, their work may not be generalizable across burn care facilities and therefore also limits the generalizability of the present paper's findings. Furthermore, sampling bias may have affected the Galveston follow-up studies. There is also a paucity of psychiatric diagnostic research regarding burns and depression in the pediatric age group (22). This lack of research limits the validity of our hypothesis regarding facial transplantation potentially decreasing the risk of depressive disorders. Additional limitations included the use of multiple QOL measures in the reviewed studies, hampering comparisons across studies; as well as the use of generic versus condition-specific QOL measures, which may have limited the sensitivity of QOL measurement for this patient population (6).

CONCLUSIONS

We hypothesize that facial transplantation for pediatric facial burns may reduce the risk of depressive and anxiety disorders, other than PTSD. Furthermore, patients with pediatric burns may not participate in necessary psychiatric and mental health care. We hypothesize that the 'dual stigmata' of disfigurement and psychiatric conditions contribute to this finding, and that with the potential for improved appearance secondary to facial transplantation that this dual stigmata may be reduced. Facial transplantation may be the new reconstructive psychosurgery with the potential promise to reduce the burden of psychiatric suffering associated with pediatric burns. Joint surgical and psychiatric research regarding reconstructive surgery and outcomes related to stigma, psychiatric adjustment and QOL are warranted.

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