Meeting Abstracts and Presentations

International Keloid Symposium
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Keloid Research Foundation in association with Texas Institute of Dermatology and the Groupe de Reflexion de Dermatologie Venerologie du Sud (GRDVS), held 1st International Keloid Symposium – AFRICA at Kenzi Menara Palace Hotel in beautiful city of Marrakesh in Morocco on April 30, 2017. This year's meeting, hosted by GRDVS, was attended by close to 120 delegates from different countries.

There were two special themes to the meeting – Clinical Understands and Management, *and* Basic Science and Future Directions for research in Keloid Disorder. During the clinical session, the invited speakers discussed challenges involving surgical, as well as medical management of keloid lesions. The following are the summary texts provided by the speakers.

Role of Mesenchymal stem cells in keloid.

Hesham Moneer Ahmad, MD
Gulf Medical University, United Arab Emirates

Mesenchymal stem cells (MSCs) are characterized by their regenerative capacity and have been recognized as a legitimate player accelerating the wound healing process. They are able to be home to sites of injury, where they can transdifferentiate into epidermal or dermal lineages. In addition, they have immunomodulatory, antifibrotic, and angiogenic abilities by secreting an enormous array of paracrine growth factors or by cell-to-cell contact. MSCs are currently receiving attention as a major candidate for cell therapy to treat or prevent excessive scars. This presentation addresses the current research status regarding the use of MSCs as therapeutic option for keloids.

Investigation of the role of epigenetic modification in keloid scar pathology.

Alghamdi, M.A.[1, 2], Wallace, H.J.[1], Danielsen, P.L.[1, 3], Melton, P.E.[4], Wood, F.M. [1, 5], Fear, M.W.[1]

Keloid scarring is characterised by abnormal fibroproliferation during skin regeneration beyond the original wound boundaries. The molecular mechanisms that underlie this pathology are poorly understood and current treatments are at best partially effective. Epigenetic mechanisms involve DNA modifications other than sequence changes (e.g. methylation) have been implicated in development, cancer and fibrotic disorders. We hypothesize that epigenetic regulation of specific gene sets underlies the progressive fibrosis of keloid scars. Therefore, identifying and targeting these changes has the potential to ameliorate

[1] Burn Injury Research Unit, School of Surgery, The University of Western Australia, M318, 35 Stirling Hwy, Crawley, WA 6009,
[2] Department of Human Anatomy, Faculty of Medicine, King Khalid University, Abha, Saudi Arabia,
[3] Department of Dermatology, Gentofte University Hospital, Denmark,
[4] Centre for Genetic Origins of Health and Disease, The University of Western Australia, 35 Stirling Hwy, Crawley, WA 6009,
[5] Burns Service of WA, Royal Perth Hospital, Level 11, GPO Box X2213 Perth, WA 6001

keloid progression. This study aims to identify novel targets in their treatment through the systematic analysis of integrated genome-wide methylation and transcriptome data. Keloid tissue was obtained from 12 patients undergoing surgical excision. Dermal fibroblasts from the tissue samples were cultured *in vitro* to passage 2. DNA was harvested, bisulfite converted and analysed using Illumina Methylation Genechips. Simultaneously gene expression data was obtained by mRNA analysis and transcriptome profiling of patients' cultured cells. Bioinformatic analysis was undertaken to compare keloid fibroblasts (KF) with DNA and mRNA derived from 6 normotrophic scar and 6 patient-matched normal skin fibroblasts samples. A sorting system using a cut-off points of Δβ "> 0.2" (hypermethylation in KF) and < -0.05" (hypomethylation in KF); and an adjusted p-value "< 0.001" were used to identify differentially methylated gene promoters. 409 gene promoters were found to be differentially methylated in KF relative to the control fibroblasts. Differentially expressed genes were identified using a fold change of "> 2.0" and adjusted p-value "< 0.001". There were 2,956 differentially expressed genes between keloid fibroblasts and control fibroblasts. Integration of the differentially methylated gene promoters and expressed genes was performed to identify putative epigenetically regulated genes associated with keloid phenotype. In Conclusion, integration of the methylation and expression data from keloid scar has identified a list of genes that are significantly differentially expressed and methylated between keloid and control fibroblasts.

Efficacy of Multimodal Treatment Approach for Keloids.

Reza F Ghohestani, MD, J. Gerardo Garcia, MD, and A. Kate Arfnia, MD
Texas Institute of Dermatology, San Antonio, TX 78257, USA. director@txid.org

Purpose of the study is to establish a two-step treatment approach for treatment of keloids since any single therapy system failed to provide a high success rate.

A total of 183 patients were treated by different modalities including Intra-lesional steroid injections, Cryotherapy with liquid nitrogen, light therapy, Fractional CO2, or Surgical excision.

Our data clearly shows excision should be reserved for very rare cases, a successful treatment requires a comprehensive approach in most cases intra-lesional steroids with cryotherapy.

Role of Lasers in Keloid Treatment: When, Where and How?

Reza F. Ghohestani, MD, Ph.D., J. Gerardo Garcia, MD, A. Kate Arefnia, MD
Texas Institute of Dermatology, 24165 W IH-10, Suite 102; San Antonio TX 78257

Significant improvement has been made in laser technology as well as broad band light therapies for various skin diseases. We here review recent advances in laser treatment of keloids and also present our data. Laser can be used in conjunction with other treatment modalities specially to remove erythema from the keloid lesions.

Head and Neck Keloids: Epidemiology and epigenetic signatures

Lamont R Jones, MD, MBA

Learning objectives:

1. At the conclusion of this activity, the participant should be able to: explain the role of epigenetics in the pathogenesis and treatment of keloids.
2. At the conclusion of this activity, the participant should be able to: Discuss the important of pathway analysis in order to identify gene signaling and regulatory networks in biological processes.
3. At the conclusion of this lecture, the participant should be able to discuss the epidemiology of keloids in the head and neck area following head and neck surgery.

Objective: To provide novel insights into the pathogenesis and treatment of keloids from the epigenome perspective by performing pathway analysis of genome wide scans of keloid DNA methylation. Furthermore, to provide head and neck specific risks for developing keloids, following surgery in the head and neck area.

Keloid and hypertrophic scars: experience of the dermatology department of

CHU Hassan II FES
FZ. Mernissi*- H. Bay Bay*- J.Ziani*- S.Gallouj*- A.Oufkir**

* Department of Dermatology- FEZ
** Department of Plastic surgery- FEZ

Conflict of interest: none

Objectives:

To present our experience of epidemiological, clinical and therapeutic features about keloid and hypertrophic scars.

Materials and methods:

Our series is about a prospective study. It' s included all patients seen in specialized healing or referred by the plastic surgery team and excluded the patients lost to follow-up.

Evaluation of a scar: by anamneses, measurements of length, thickness, depth, stretching, vitropression, dermoscopy, test Joint assessment, pruritus test, photography, patient's opinion.

Our protocol: No ideal treatment. Several strategies according to the scars. If hypertrophic scar inflammatory / keloid scar inflammatory without excess volume: Laser PDL/ IPL or Laser CO2 + Intra-lesional corticosteroid injections .

If inflammatory keloid scar large volume: Intra-cicatricial excision with intra-cicatricial suture with intra-lesional injections of corticosteroids at 1 month post-surgery or Laser PDL /IPL and after, CO2 laser CLOBETASOL 1x / month

If fibrous keloid scar, from small to medium surface: Surgical treatment: extra-cicatricial excision + suture with Injection of corticosteroids at the edges and CO2 laser CLOBETASOL 1x / month +

For keloid disease: Etiologic treatment (acne retinoid per os for example) was recommended before phenol 40 %. Always: Pressotherapy / custom compression garment or splint several months or years + plates silicone 24/24h and / or silicone gel 2 x / day and antihistaminic if pruritus

RESULTS

119cases collected, 136 scars. The Average age was 23 years (extreme age: 1 year - 81 years). The Sex Ratio M/F: 0.6. The Phototype was often type III and IV. The number of Keloids was 58 and for Hypertrophic was 61. The Median of the starting management deadline: 6 months. The topography was Trunk: 21%, Face + neck: 52,1% 62cas. The etiology was post-surgery: 26.05%, trauma: 32.77%, burning: 30.25% and Other: 10.92%.

DISCUSSION

The difficulty of differentiating at an early stage a keloid from a hypertrophic scar does not facilitate the therapeutic choice. The treatment of keloids is necessary if: Invalid functional signs, mechanical discomfort, unattractive appearance. We compare our results to literature. The best results were signaled with treatment by laser CO2 and corticosteroids.

CONCLUSION

The dermatologist must reclaim the management of keloids, The Multidisciplinary management was necessary. The care Long-term plan and program was recommended.

Heterogonisty of keloids: is it a factor in keloid recurrence?

FW Nangole, MD[1], DR Zuir[2]

Keloids have been shown to have a high recurrence rate irrespective of the treatment modalities. Surprisingly keloids of a same anatomical region have been shown to behave differently. For instance, ear lobe keloids may recur on one side while the opposite ear lobe no recurrence is noted. No reason has been advanced to these findings.

Histological specimens of keloids in 20 patients were analyzed by the authors with the objective to identify the differences in their histological composition. The variants analyzed were inflammatory cells, proliferative cells, capillary densities and collagen matrix density.

In conclusion, we found out that there was a different combination and densities of the various components in the keloids suggesting that this difference could contribute to difference behaviors of keloids in similar or different individuals.

[1] Dept. of Surgery, University of Nairobi
[2] Dept. of Pathology, University of Nairobi

Treatment of keloid with phenol: Myth or Reality?

Ait Ouakrouch I, Hocar O, Akhdari N, Amal S
Dermatology department, University Hospital Mohamed the VI th, School of medecine, Cady Ayyad University, Marrakesh, Morroco

Abstract

PURPOSE: Critical evaluation of a new treatment for keloid scars using a 40% phenol solution in accordance with a predefined protocol.

PATIENTS AND METHODS: A prospective and longitudinal study of seven patients who consulted for a keloid from June 2015 to February 2017 (over a period of 20 months).

RESULTS: The average age of our patients was 39 years old, all of them were males with tanned skin. Most of keloids were located on the trunk but also arms and

back. The mean number of phenol sessions was 8.7. Only one patient was satisfied with the treatment, but he relapsed after a 3-month halt. A change in local keloid pigmentation was observed in 71% of patients. Local adverse reactions (itching, infection, ulceration) were seen in all patients. None of them had systemic signs of phenol.

CONCLUSION: Use of phenol as a topical treatment of keloids appears valuable but it needs more objective re-evaluations.

KEYWORDS: Keloids; Pathological scarring; Phenol; Treatment

Treating Keloids with Adjuvant High-Dose Rate Brachytherapy.

Jonathan Tsao MD, Sarah Rauth MD, Jasper Yuen MD, Kailin Lawrence MRTT, Gwen Bond RN, Eric Sabondjian CCPM
Division of Radiation Oncology, Carlo Fidani Peel Regional Cancer Centre, Trillium Health Partners, 2200 Eglinton Avenue West, Mississauga, ON Canada L5M 2N1

The literature supports the role of postoperative adjuvant radiotherapy for keloids in decreasing the risk of recurrence. Traditionally external beam radiation has been employed but more recently described is the use of brachytherapy. This institutional retrospective review analyzed the clinical results for 15 patients with 20 keloids treated over the last 2 years with surgical excision and postoperative HDR brachytherapy. The patients ranged in age from 19 to 78 years and there were 4 males and 11 females. Thirteen were of Asian or African race. All patients were treated to a dose of 18 Gy in 3 fractions at a depth of 0.5 cm. within 36 hours following excision. Median follow up was 9 1/2 months and median active treatment length was 5.8 cm. There was no case of recurrence but there were 3 cases of transient hyperpigmentation, 4 cases of wound dehiscence, and one case of infection. These early clinical results are promising but longer follow up is required to better evaluate the full potential of adjuvant HDR brachytherapy for the treatment of keloids.

Topic Code: Brachytherapy, Keloids

Network integration of epigenomic data: Leveraging the concept of master regulators to prioritize keloid -specific therapeutic targets.

Maria J. Worsham, Kang M. Chen, Josena K. Stephen, George Divine, Indrani Datta, Lamont R. Jones.
Henry Ford Health System, Department of Otolaryngology HNS, Detroit, MI 48202, USA

Our group previously characterized the keloid methylome using a global discovery approach to identify 152 differentially methylated genes between keloid and normal tissue. Several of these genes were located in known bionetwork pathways involved in critical biological functioning and signaling events using Ingenuity Pathway Analysis (IPA). The top 10 statistically significant genes (false discovery rate < 0.015) in IPA were identified as VAMP5, ACTR3C, GALNT3, KCNAB2, LRRC61, SCML4, SYNGR1, TNS1, PLEKHG5, PPP1R13-α. The purpose of this study was to further establish the 'driver' potential of these 10 genes.

Causal Networks are small hierarchical networks of regulators whose activity can be modulated by the expression of downstream target genes to enhance understanding of the effect of upstream master regulators on disease or function. To assess whether key mechanisms underlying the biological activities of the top 10 keloid-specific genes (targets) might confer 'driver' status, their master regulatory networks were identified utilizing Causal Network Analysis (CNA) software from Ingenuity Pathway Analysis (IPA).

Causal Network Analysis software identified 4 hierarchical networks that included 4 master regulators (pyroxamide, tributyrin, PRKG2, and PENK) and 19 intermediate regulators. These hierarchical networks suggest potential driver roles for their downstream keloid gene targets in the pathogenesis of keloids.

This study is an illustration of IPA's CNA module to decipher novel master regulators for causal relationships with downstream epigenetically deregulated keloid target genes for further consideration as potential therapeutic targets. Future directions for translation of this novel data include application to a biological system such as keloid fibroblasts and potentially evaluating gene expression for mechanistic corroboration.

Efficacy and Side Effects of Intra-lesional Steroid Injection in Treatment of Keloidal Lesions.

Michael H. Tirgan, MD
Keloid Research Foundation, New York, NY.

Intra-lesional Steroid (ILS) Injection is the most commonly used treatment modality for Keloid Disorder (KD). An IRB approved online survey was launched in November 2011. Patients' perception of the efficacy of ILS in KD is reported here with special attention to worsening of keloids in 16.6% of cases.

As of September 23, 2016, 1406 consecutive unselected patients participated in this survey. 777 patients reported having had ILS injections for KD and we able to provide an assessment of the efficacy of ILS on their KD.

Only 0 patients (1.2%) reported that ILS cured their keloids. ILS improved KD in 254 patients (32.7%). 385 patients (49.5%) reported no improvement with ILS and an additional 129 patients (16.6%) reported ILS causing worsening of their KD.

With several limitations, this study suggests that only one third of patients have Steroid Sensitive KD and two thirds have Steroid Resistant KD. The most interesting finding of this study is that 129 patients (16.6%) reported worsening of their keloids after ILS injections. Worsening of keloids after ILS has not been reported previously. Keloids occur as a result of dermal injury in genetically susceptible individuals. ILS-induced tissue injury in Steroid Resistant KD can lead to formation of a new keloid or aggravation of a previously formed keloid.

Post-otoplasty keloids, case series and report of successful treatment with cryotherapy.

Michael H. Tirgan, MD
Keloid Research Foundation, New York, NY.

Background: Otoplasty is a corrective procedure used to reshape the ears, commonly performed on young individuals and even children to improve the appearance, shape, or angle of the ears. Post-otoplasty keloids are known complication of this procedure. Safe and effective treatments are needed for otoplasty induced posterior auricular keloids.

Objective: To review the clinical presentation and natural history of otoplasty induced keloids, and to propose non-surgical intervention with cryotherapy as primary treatment.

Material and methods: This is a retrospective study of 13 consecutive patients with post-otoplasty, posterior auricular keloids who were seen by the author in his keloid specialty practice. Medical records and photographs of the lesions were analyzed. Descriptive statistics are provided.

Intervention: Cryotherapy was the primary treatment for bulky keloid.

Results: Two patients had minimal keloid formation at the sites of otoplasty and were advised to primarily receive, or continue with, intra-lesional steroids. Eleven patients had bulky keloids and were offered cryotherapy as primary treatment. Nine patients consented to the treatment. Three patients are still receiving treatment and as of their last follow up visit had achieved partial reduction in the mass of their keloids. Six patients completed their course of treatment and achieved desired results with complete or near-complete resolution of their keloids. One patient had minor recurrence and is now undergoing treatment.

Conclusions and Relevance: Using cryotherapy as primary intervention for bulky post-otoplasty keloids can successfully reduce the bulk of these lesions. Cryotherapy seems to not trigger the wound healing response to the extent that surgical scalpels do, therefore resulting in a much better therapeutic outcome. Additionally, cryotherapy is a much less morbid alternative to surgery. It is also less costly and very easy to administer in an out-patient setting.

Massive Ear Keloids. Why some ear keloids get this bad?

Michael H. Tirgan, MD
Keloid Research Foundation, New York, NY.

Keloid Disorder (KD) is an inherited wound healing ailment, frequently seen among Africans /African Americans and Asians. Ears are common locations for development of keloids. This review focuses on natural history of massive ear keloids and risk factors that lead to formation of these life-changing and debilitating tumors and recommendations for prevention.

This is a retrospective analysis of 283 consecutive patients with ear keloids. Keloids were assessed visually and categorized according to their size.

1- Massive ear keloids, whereby the size of the keloid mass was greater than the surface area of the corresponding ear. Thirteen patients (4.5%) met this criterion.
2- Semi-massive ear keloids, whereby the size keloid mass was at least 50 % of the surface area of the corresponding ear. Eighteen patients (6.3%) met this criterion.
3- Large ear keloids, whereby the size of the keloid mass was more than the size of the corresponding earlobe. 181 patients met this criterion and were placed in this category.
4- Small ear keloids, whereby the size of the keloid mass was less than the size of the corresponding earlobe. Seventy-one patients met this criterion.

Despite the fact that this study is limited by its size and patients from only one medical practice that does not offer surgery for treatment of keloids, several interesting factors stand out as risk factors for development of large, semi-massive and massive ear keloids.

- Race stands out as a major potential risk factor in all four groups, most importantly among those with massive, semi-massive ear keloids, with only five Caucasians among 31 patients in both these groups.
- Prior keloid removal surgery was the most important risk factor among all 31 patients with massive and semi-massive ear keloids in this study. Without an exception, all patients had undergone anywhere between one to seven prior keloid removal surgeries.
- Prior keloid removal surgery was the most important risk factor, among all 181 patients with large ear keloids in this study with 131 patients (73%) having had history of prior keloid removal surgery.

Surgical removal of keloids will indeed trigger this pathological wound healing response and therefore, can result in development of a much larger ear keloid. In the author's opinion, the paradigm shifting approach is a move to utilize cryotherapy for treatment of all primary and secondary ear keloids.

Towards understanding the molecular and cellular cross-talk in keloid pathophysiology.

Mark Fear[1], Cecilia Prele[2], Andrew Stevenson[1]. Nicole Hortin[1], Nutan Chaudhari[1], Hillary Wallace[1] and Fiona Wood[1,3]

Keloid scarring is a severe and debilitating fibrotic skin disease with limited treatment options. Whilst the role of fibroblasts and the imbalance in collagen deposition/degradation is a key feature of this disease, the contribution of cell types other than the fibroblast to the pathology are less clear. In addition, the molecular changes within the fibroblasts that are important in disease progression and heterogeneity are not well understood.

We are currently investigating changes in fibroblast phenotype, epigenome and transcriptome within keloid scars. We are also investigating the endothelial, epithelial and neuronal changes in keloid scars and how these may influence fibroblast function and disease. Finally, we are investigating the potential efficacy of drugs that disrupt collagen and matrix stability in modulating keloid scarring through the influence of the matrix architecture on cell function.

The aim of this research is to drive towards a better understanding of the key triggers for keloid initiation and progression, facilitate the development of new treatments and ultimately to develop therapeutic approaches that can prevent keloid scarring rather than focus on disease management.

[1] Burn injury research unit, University of Western Australia, M318, UWA, 35 Stirling Highway, Crawley, WA 6009. Australia.
[2] Institute of Respiratory Health, University of Western Australia, WA, Australia.
[3] Burn service of Western Australia, WA Department of Health, Perth, Western Australia, WA. Australia

Insights into keloid pathogenesis arising from a site-specific in situ approach.

Natalie Jumper
Plastic and Reconstructive Surgery Research, Stopford Building, Manchester M13 9PT

Keloid is a cutaneous fibroproliferative tumor characterized by heterogeneity and aggressive local invasion that remains refractory to the abundance of available therapies. Macroscopic, microscopic and molecular differences

between the center and margin of keloid scars can be masked by both whole tissue biopsy and monolayer culture techniques. Our aim was to identify potential biomarkers or mechanisms through the exploitation of these site-specific differences, for both in situ epidermis and dermis. To this end, we applied laser capture microdissection (LCM) combined with whole genome microarray to center, margin and extra-lesional keloid biopsies and compared these with normal skin. Initial microarray results of interesting targets were validated with qRT-PCR and immunohistochemistry. Further data analysis and enrichment led to a number of hypotheses, of which two were explored in detail. Our first hypothesis concerned upregulation of the aldo-keto reductase enzyme AKR1B10 in keloid epidermis, suggesting retinoic acid pathway dysregulation contributed to keloid pathogenesis. Our second hypothesis investigated the role NRG1/ErbB2/FAK/Src signaling in keloid fibroblast migration at the margin dermis. The effect of reduced retinoic acid on ErbB2 expression-induced proliferation not only links these hypotheses but also emphasizes the significance of epithelial-mesenchymal interactions in the formation of keloid scars. Analysis further identified novel expression patterns crucial to collagen deposition, a complex inflammation network, candidate contribution to therapeutic resistance and indicated areas for future research, including the potential of a cancer-like stem cell niche. Our results support the use of LCM in the identification of in situ signals that may be otherwise overlooked with alternative methods of dissection. The isolation and localization of these previously masked signals to specific sites within the keloid has mechanistic as well as therapeutic implications in the management of this disease.

Epidemiological and Clinical Aspects of Keloids in Africa.

Moussa Diallo, MD
University Gaston Berger of Saint-Louis,
234 Saint-Louis /Senegal.

Africa is said to be an endemic environment of keloid. This condition is not only disfiguring and aesthetically displeasing, but can also be dysfunctional and cause immense discomfort and psychological impairment. Despite its common occurrence, the low socioeconomic status, ineffective treatment modalities and the perception that keloids are a harmless disease influence how patients seek medical treatment in this region.

Therefore, there are no recent population-based epidemiological data on the prevalence of keloids in Africa. Nevertheless, in certain regions, the incidence has been reported as 16 % with a slight predominance in women and in young age.

Clinically, there is strong evidence of different phenotypes of keloid scarring.

In African patients, keloid appear special by their exuberant, tumoral, diffuse and hyperpigmented characters. The frequency of pruritus, pain and bacterial superimpose seem also higher. In this region, keloids can also be induced by scarification practices and might be frequently associated with severe arterial hypertension and fibroids.

Mechanisms underlying keloid formation are not yet fully elucidated. The heritability and genetics of this condition have been a focus of recent research and are motivated by the increased familial clustering of this disease in twins, multigenerational family pedigrees and by its racial predisposition. However, the results have been conflicting, with various modes of inheritance ranging from autosomal recessive to autosomal dominant with incomplete clinical penetrance and variable expression. Recently, genetic loci at 7p11 have been identified in African-American family.

This presentation provides an overview of the most current and available data concerning the epidemiology, clinical and genetic of keloid in the African continent.

Clinical and Epidemiological experience of keloids in the Department of Dermatology at Ibn Rochd University Hospital.

A. Aboutaam, F. Hali, S. Chiheb
Dermatology venereology, Ibn Rochd's Hospital,
Casablanca Morocco

Keloids are the result of an overgrowth of dense fibrous tissue that usually develops after healing of a skin injury. The tissue extends beyond the borders of the original wound, does not usually regress spontaneously, and tends to recur after excision. Their varied form can not only be linked to a possible triggering trauma but also to the mechanical constraints that influence the activity of the fibroblasts, reflecting the evolution of the lesions and guides the therapeutic choices. We have reviewed the images of all photographed keloids in our center for 11 years trying to recognize these morphological stereotypes.

Clinical photographs taken at our Service of dermatology at Ibn Rochd University Hospital in Casablanca for patients consulting for keloids. The data record focused not only on the morphology but on the location, age, sex, phototype and the favorizing factor.

We observed 76 patients,51 females and 25 males. The average age was 26. Among them were 49 of phototype IV, 23 of phototype III, 3 of phototype V to VI and 1 patient of phototype VI. The consistency can range from soft and doughy to rubbery and hard. The total lesions were around 156 with a predominance of multiple nodular lesions about 59 %, located on the back, the occipital region, the chest, the face and the shoulders, mostly secondary to acne. Another other location on the earlobe and ear helix, dumbbell keloids, were 13 %. 20 %, about 31 lesions, were of multiple forms from butterfly, two lateral wings that expand and a central area connecting the two lateral portions, to flat keloids are often seen along the extremities (arms, elbows, knees, and legs) or along the chest, shoulders, or back. The rest of the forms were annular, linear, or post-surgical scars keloids.

This study confirms the approach towards a topology of the keloids integrating their morphological characteristics. This approach has a double interest, a physiological (the presence of stereotypes models of a possible initial traumatic factor) and a therapeutic.

Psycho-social impact of keloid disorder and first-hand personal experience.

Lina Ndjok - Medical Student
Faculté de Médecine la Timone in Marseille, France.

Keloid scars may be painful, itch severely and be cosmetically disturbing. However, as small some of these may be, they do have a major impact on a person psyche. Unfortunately, only a few studies talk about this topic psychosocial aspect of keloids which is sad because keloids have a major impact of a person's psyche.

One study titled "Burden of Keloid disease: A cross-sectional Health-related quality of life assessment" by Biljar quoted "pain and itch" as the "strongest indicators of a low mental and emotional health related quality of life (HRQL). In that study based on 106 keloid patients with no other skin diseases, the authors evaluated the association of keloid disorder with HRQL. In the conclusion, the authors showed that having keloid disorder was "associated with a considerable impairment of emotional well-being, with most impairment on the mental HRQL.

The second study "The dermatology life quality index as a means to assess life quality in patients with different scars types" by Reinholz, investigated different types of scars regarding their impact on quality life using the Dermatology Life quality index or DLQI. This study comprised of 130 patients with different types of scars including keloids. "Physiological scars" were established as a baseline for comparison between the groups.

The Dermatology Life Quality Index is a ten-question questionnaire used to measure the impact of skin disease on the quality of life of an affected person. The questionnaire contains ten questions covering different topics. Each question refers to the impact of the skin disorder on the patient's life over the previous week and is scored from 0 to 3, giving a possible score range from 0 (no impact of skin disease on the quality of life) to 30 (maximum impact on the quality of life). The DLQI can provide clinicians with more accurate insight into the impairment of quality of life experienced by individual patients.

The control group, that is, the patients with physiological scars, scored a mean DLQI score of 2.07+/-3.56 and patients with keloids, a score of 6.06+/-4.00, which made a difference in the overall score of +3.99. So, using this DLQI, the study demonstrated that different subsets of pathological scars do affect patients in a different magnitude, especially in this case, the group of keloids.

The third study "Quality of life of patients with keloid and hypertrophic scarring" used a questionnaire on experience with skin complaints and was distributed to 100 patients with keloids and hypertrophic scars. The patients were evaluated on two scales: physiological and physical impairment. Test-retest reliability of the questionnaire was excellent (corr. >0.9). Good validity was suggested by the correlation of physical impairment with pain, pruritus and the amount of restriction of mobility. The psychological scale was associated with pain and restriction of mobility. This study demonstrated an impairment of quality of life in a large group of keloid and hypertrophic scars.

The fourth study untitled "Keloid: assessment of effects and psychosocial impact on subjects in a black African population" by Dr. P.B Olaitan, shows in its conclusion that, among the 61 males and 70 females that comprise the study, "35.8% of the patients believe that the keloid swelling limit their interaction". The study emphasized the fact that the difficulty of finding a good treatment greatly impacts mental health. Moreover, the authors point out that "although people of all ages suffer from this condition, the patients are often young and

healthy and become burdened with an activity limiting lesions or psychosocial stresses associated with a perceived esthetic defect and severe negative impacts on the quality of life of patients with keloids".

It is important to emphasize the fact that young people are the most vulnerable.

An unpublished study examined the age onset of keloid disorder and showed the peak of age of onset at the age of 16. This is when teenagers and young adults are psychologically most vulnerable and very sensitive to their body image. They become more concerned about what people may say or think and the rapidity of growth of the keloid in this age group accentuate the vulnerability.

All these studies show the same conclusion. Keloids and other hypertrophic scars affect the psychology of people who are suffering from it because of the appearance, pain and itching. Those factors considerably affect the emotional well-being, reduce their mobility and lead to withdrawal from social life.

So what about my personal experience?

At the age of five, after getting my earlobes pierced, I developed keloids. That was the beginning of a long battle between unsuccessful repeated surgeries every two months starting in 2003, associated with other treatments such as steroid injections and massages by kinesiotherapists.

For about eight years I underwent several excisions of my keloids through surgery. I cannot recall exactly how many surgeries I had because I couldn't keep count, but I do know that I saw the inside of an operation room more than ten times. Those surgeries as I mentioned were unsuccessful because they only fastened the process of recurrence. After each surgery, the recurrence was larger and faster which meant that I had to be back in surgery every two months starting in 2005 up until 2011. Six years of my life! Can you imagine? Six years of undergoing surgery every two months because the keloids weren't stable enough even after surgery.

Fortunately, in 2014, when I was living in the United States, my parents came across a new treatment for keloid patients: cryotherapy. I was able to be treated twice in the United States with great satisfaction because, for the first time, we found a treatment that stabilized the recurrence of my keloids for three years which made a major difference with the surgery treatment.

Unfortunately, as I had to return to France to start my medical studies, I wasn't able to continue with the cryotherapy treatment in my home country as it is difficult to find the product and the specialists who have the nitrogen liquid are reluctant to treat my keloids with cryotherapy as they don't know if it really works or because it is not something they are used to perform.

It wasn't enough that I had to suffer from my earlobe keloids, then others started to appear in 2012 on my chest, arms and back. Living with this disorder impacts my life on so many level. It isn't so much about the physical impairment that includes severe itching from time to time because I learned how to manage it. It is, however, more about the social and psychological aspects of my life. As I grew up, I became much more concerned about what people would say or think if they happened to see my scars, and thus I constantly made sure that everything was hidden to avoid any questions or inquisitive stares. I practice sports and love dance. These extracurricular activities require for me to be exposed and something as simple as tying my hair up becomes a problem because I don't want people to see.

Moreover, as a medical student, I have to dress according to the function, see patients for examinations and attend surgeries. It is psychologically very challenging. About four months ago, during one of my internships, I wasn't allowed to enter the operation room and observe an orthopedic surgery because I couldn't completely cover my hair because of my large earlobe keloids. This situation impacted me very deeply mentally and made it difficult for me to go back to the university the next day or even my internship the next week.

None of the published studies come even close to touching the surface of what it is like to live with this disorder. These articles talk about the pain, the itching but they never talk about the major impact on a person psyche. I am living with this disorder and I know what it is like to be mentally depressed because of it. That day when I had to leave the operation room was blow to my head. It is a shame that only a few published articles try to get the core of the subject.

Living with this disorder means that I have to find ways to cope. My parents played a major role as they have been with me since I started to develop keloids. Not once have they stopped looking for a cure that would work. And as I mentioned, finally finding a treatment was a relief in knowing that there is still hope for myself and other patients like me who suffer from this disorder.

The chronic nature of these lesions, the mental and emotional burden of this disorder and the challenges this disorder raises to find treatments has a significant psychosocial impact on the patient. To conclude, I would like to thank those who work on the treatment of this psychological damaging disorder and I hope that cryotherapy will be expended in order to help those concerned by it.