

Complications of Noninvasive Upper Lid Blepharoplasty (Plasma Exeresis(Plexr)): A Case Series and Mini-Review of the Literature

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Abstract

Plexr is the latest technology for Blepharoplasty and Non Invasive Eye Lid Surgery. Limited studies have been done on this technique and so far no side effects have been reported. For the first time in this study, we will describe 3 patients with complaints after Plasma Exeresis (Plexr). Here the authors present 3 patients that presented to the authors institution over a 5-month period with complaints after Plasma Exeresis (Plexr). Complaints included upper lid skin burns, severe eyelid swelling and erythema, and Postinflammatory hyperpigmentation eyelid lesion and unhealing dermatochalasia. In this report we discuss the clinical presentations, diagnostic evaluation, treatment options, and clinical outcomes as they relate to Complications of Noninvasive Upper Lid Blepharoplasty (Plasma Exeresis (Plexr)).

Keywords: Platelet rich plasma • Androgenetic alopecia • Evaluation • Minoxidil

Introduction

The periorbital region is a main contributor in facial aesthetic appearance, therefore it is been usually requested in facial rejuvenation [1]. Dermatochalasis is redundancy and laxity of the eyelid skin and muscle [2]. It is common in elderly persons and is occasionally seen in young adults [1]. It also can be a functional problem for the patients as it frequently obstructs the superior or temporal visual field [3]. Dermatochalasis is a cosmetic concern as patients note a fullness or heaviness of the upper eyelids which may lead to older appearance [4].

Despite new Dermatochalasis treatment techniques, surgical treatment is the main technique and still a commonly requested procedure for eyelid dermatochalasis, especially in severe cases, and has been associated with excellent results in expert centers [3]. However, its application is limited due to some contraindications and it may be associated with several complications, such as ectropion, hollow appearing eyelid sulcus and diplopia. Additional complications like dry eye syndrome, corneal abrasion, orbital cellulitis, preseptal cellulitis, asymmetry and scarring [5].

Due to potential risks of invasive technique, non-surgical therapy of the eyelid skin. Sometimes preferred and can even be performed to patients at surgical risk [6]. Plasma exeresis and fractional plasma (plexer) are non-surgical methods, which may provide a less invasive treatment option of upper eyelid dermatochalasis with faster rehabilitation [1]. Most studies about plexer have confirmed its effectiveness and suggesting it as a new technique in Dermatochalasis [5]. In this study, for the first time, we try to investigate the complications observed in Plexer by introducing some cases and we discuss the clinical presentations, diagnostic evaluation, treatment options, and clinical outcomes as they relate to Complications of Noninvasive Upper Lid Blepharoplasty (Plasma Exeresis(Plexr)) and finally we also present appropriate review of literature.

Case 1

35-year-old woman who complained of a worsening of bilateral upper eyelid dermatochalasia, after noninvasive upper lid blepharoplasty (Plasma Exeresis(Plexr)) that performed 2 years ago. Patient also complained of

bilateral upper eyelids spotty lesions. During ophthalmological evaluation, she just had bilateral upper eyelid dermatochalasia and hypo and hyper pigmented skin lesions in the upper eyelid. Due to the patient's cosmetic complaint, the patient underwent blepharoplasty surgery, which can be clearly seen after the operation. Histology of removal skin, showed skin tissue with chronic inflammatory cells infiltration with one area containing foreign body granulomatous inflammation. In the follow-ups, the patient was completely satisfied and had no complaints.

Case 2

55-year-old woman who underwent plasma exeresis (plexr) 3 years ago for treatment of lower eyelid dermatochalasia, referred to us center for cosmetic complaints such as lower eyelid skin lesions and worsening lower eyelid dermatochalasia. In our evaluation, she had hyper-hypopigmented skin lesions of the lower eyelid and dermatochalasia of the lower eyelid. According to the patient's complaint, she underwent lower eyelid blepharoplasty. After surgery, she was completely satisfied without any complication. Histology of removal skin, showed fragments of skin tissue with dermal edema and collagen fiber degeneration without significant inflammation.

Case 3

45-years-old woman presented with complaint of upper eyelid lesions, which occurred following a plexor 4 days ago. She was underwent plasma exeresis (plexr) to treat blepharochalasis 4 days prior to referred. After this procedure, she suffered from upper eyelid lesions, pain and swelling of both upper eyelid. Ophthalmologic evaluation just showed bilateral upper eyelid scalling lesion, With a bleeding base, which was very similar to burn lesions. According to evaluation, topical antibiotic treatment was started for the patient. follow up 2 weeks later showed, multiple hypopigmented lesions were seen at the site of the plexr. According to the patient's cosmetic complaint, the patient underwent blepharoplasty 1 month later. Histology of removal skin showed, dermal edema and chronic inflammation and focal foreign body type granulomatous inflammation.

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Discussion

Upper and lower lid dermatochalasis managed by blepharoplasty for functional and cosmetic goals [1]. However, new nonsurgical techniques have evolved to attain the required aesthetic outcome [6]. Surgical upper lid blepharoplasty offers a better option for severe dermatochalasis with excess skin [7,8]. In addition, surgical blepharoplasty is more noticeable in cases associated with significant steatoblepharon, ptosis, lacrimal gland prolapse, or lash disorders [9].

Surgical blepharoplasty can leave a scar at the site of incision. However, scar complications as wound dehiscence, keloid formation, infections and disfigurement are rare, but are still present [10,11]. With proper surgical technique scarring with its associated complications is rarely a problem. Additionally, in surgical blepharoplasty, lid edema and ecchymosis usually improve within 1–2 weeks, especially if there is no bleeding tendency [4,5].

Nonsurgical techniques have been introduced in a trial to achieve an acceptable aesthetic outcome without the need for surgical intervention [5]. Plasma exeresis (plexr) ionizes gases present in the spatial gap between the proximal tip of the instrument and the tissue being treated [5]. Plasma is generated through the tip of the device in the form of ultra-gas like state of matter and the energy created is transferred onto the superficial skin layer to stimulate skin tightening [12]. The tissue is sublimed; direct transfer of the tissue from a solid form to a gaseous state is created. The heat is absorbed by the tissue being targeted and is not transferred to surrounding tissue or the sub cutis. Plasma with use of rise of temperature, induces denaturation of collagen and other proteins in the skin. The rise of temperature stimulates skin contraction and tightening through sublimation of the superficial layers only down to a depth of 0.1 mm at the level of the stratum corneum, without any ablative effect on the skin [13].

Numerous studies have compared surgical blepharoplasty and plexr. sotiris et al. conducted one of the largest studies on the subject. In the Otiris study, 1,000 patients (800 females and 200 males) underwent upper eyelid blepharoplasty by Plexor. The results of the study showed that the satisfaction rate in the 100 patients who underwent plexus was 100%, and achieved the desired results. Otcorn was excellent for all patients, without any sutures or incisions, and no complaints (ectropion, entropion, legophthalmos, etc.). They conclude that none of the 1,000 patients had any complaints leading to a referral. Finally, Hortis et al. have proposed plexus as a very practical method in the treatment of upper eyelid blepharoplasty.

Tharwata et al. in prospective, comparative, interventional case series study that included 10 patients with bilateral upper lid dermatochalasis, compared surgical blepharoplasty and fractional plasma (plexr). Surgical upper eyelid blepharoplasty was performed on one side and fractional plasma (plexr) was performed on the other side for each patient. No statistically significant difference was found in satisfaction between the two techniques. Lid edema was noted in both groups, ecchymosis was significantly obvious in the eyelid that underwent surgical blepharoplasty compared with the lid that underwent fractional plasma (plexr), but it resolved within the first week. Finally they recommended Fractional plasma may offer a less invasive alternative to surgical upper lid blepharoplasty in mild to moderate cases.

Hassan et al. in clinical trial study, evaluate plasma exeresis as a new technique for nonsurgical treatment of dermatochalasis of the upper eyelid. This clinical trial included 40 female patients with dermatochalasis. Each patient received 3 sessions of treatment with the technology of plasma exeresis with one-month interval. They evaluated lid laxity according to Facial Laxity Rating Scale (FLRS), Marginal Crease Distance (MCD) before and after treatment and patient satisfaction score. The results of this study showed that significant decrease in eye lid laxity (FLRS) after treatment where $P < 0.001$; 36 (90%) patients had change and 4 (10%) patients without change in general. There was a significant increase in MCD after treatment ($P = 0.001$). Hassan et al. emphasized this important point that Plasma

exeresis seems to improve appearance of the upper eyelid, without any serious adverse events and could be a valid solution for dermatochalasis especially in mild and moderate cases.

All studies have focused on the usefulness and high efficiency of the plexr, and none of the studies have mentioned the complications of the plexr. This is the first study to investigate plexr complications. Although in our 3 patient, they had mild to moderat dermatochalasis, but plexer was ineffective, and patients still complained of dermatochalasis. in one patient, that had lower lid dermatochalasis, not only it get better, it had gotten worse. So it seems that contrary to studies, which considered 100% efficiency for Plexer in cases of mild and moderat dermatochalasis, Plexr efficiency is still unclear, and seems plexer isn't effective in lower lid dematochalasis, finally in our patients, for cosmetic satisfaction. They underwent surgical blepharoplasty.

All 3 of our patients, have complained of hyper-hypopigmented lesions. Most of these lesions appear to be caused by the spot of the plexr. All of our patients had cosmetic problems with these lesions. Finally after surgical blepharochlasia most of this lision was removed.

On patient had complained of burning lesion due to plexr. This lesion was scaling, bleeding in some site, edematous and erythematous. It seems that this patient was initially underwent plexr with a misdiagnosis of dermatochalasis, because the examination revealed that the patient had blepharochalasia. It is likely that the reason for the severe reaction to the plexr in this patient was the presence of blepharochalasia. If such lesions occur, prevention of infection is the most important task. In our patient, after control of this lesion, hypo-hyper pigmented lesion was formed at the site of the previous lesion. It seems that blepharochalasia has caused more severe reactions after plexr treatment. Therefore, plexors are not recommended for the treatment of blepharochalasia, and physicians should be careful in choosing the type of patient for the plexr, and differentiate well between dermatochalasis and blepharochalasia.

In the pathology of the specimens after dermatochalasia surgery, in two patients focal foreign body type granulomatous inflammation was formed in Figure 1 and in the pathology of another sample, chronic inflammation is seen based on the pathology of all three of our patients, the authors hypothesize that plexr, can cause chronic inflammation in the skin tissue, and in the long run, this inflammation can cause cosmetic complications of plexr (eg, hyper-hypopigmented lesions). It seemed that despite the emphasis of several studies on the plexr's safty, more pathological studies are need to confirm this. Finally, further studies are required with larger numbers of patients, longer follow up period are need to evaluate plexr treatment.

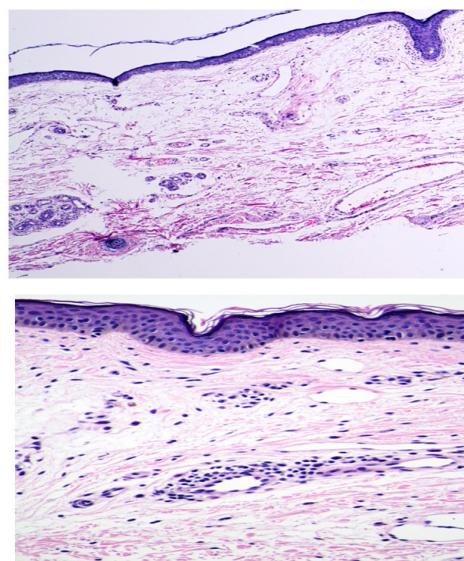


Figure 1. H and E skin tissue with chronic inflammatory cells infiltration and foreign body granulomatous inflammation.

Conclusion

Plexr as a new technique of noninvasive Upper Lid Blepharoplasty, it seems that despite the studies, which emphasized the full quality of this technique, it can also have complications. Special care in differentiating between dermatochalasia and blepharoplasty by careful physical examination can prevent some complications.

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