

# Patient satisfaction as an excellent track record in nonsurgical rejuvenation procedures

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**Abstract. – OBJECTIVE:** Patient satisfaction is the goal of most aesthetic procedures. The aim of this study is to analyse nonsurgical rejuvenation procedures in a private practice setting, over a period of 10 years, evaluating patients' compliance, satisfaction and maintenance of a good fiduciary link with the medical operator.

**PATIENTS AND METHODS:** A retrospective study was performed on 429 patients who received nonsurgical rejuvenation procedures. Four types of treatments were considered: Botulinum toxin type A injections, Hyaluronic acid or Poly-L-lactic acid injections, and a combination therapy. The outcome analyzed included a number of patients for each treatment for each year, the treatment time interval, the number of treatments for each patient, the number of treatments according to facial sub site and the "degree of satisfaction".

**RESULTS:** The most required treatment was combination therapy (36.8% of patients). The mean time and the median time of permanency in the study were respectively 19 and 6 months. After 18 months, which is the time that we considered to attest a good "degree of satisfaction", 55% of patients were still in the study. Patients with only one treatment were excluded.

**CONCLUSIONS:** The study findings support evidence of a more recently described increase in popularity in minimally invasive aesthetic procedures, of which combination therapy has the best performances with a good degree of satisfaction.

## Key Words:

Minimally invasive procedure, Non-surgical facial rejuvenation, Patient satisfaction, Aging, Fillers, Botulinum toxin, Aesthetic procedure.

## Introduction

The process of aging is complex and inevitable, characterized by global facial volume loss, dynamic and static wrinkles and folds caused by the repetitive movement of facial muscles and laxity

induced by gravity<sup>1-4</sup>. The aging face reflects the interplay of numerous intrinsic and extrinsic factors, such as skin elasticity, loss of subcutaneous fat, bone and soft tissue remodeling, sunlight-damage, smoking, alcohol use and diet<sup>5-7</sup>.

Physical appearance and other people's perception of us play an important role in social and psychological functions, wellbeing, self-esteem, and self-confidence. Although not medically necessary, aesthetic products and procedures reflect the desire to look and feel as good as possible, a desire that has been documented throughout much of the history of our species<sup>8-11</sup>. Over the last 100 years, various aesthetic procedures have been described<sup>12</sup>. Various approaches and methods in delaying or correcting the effects of aging have changed drastically<sup>13,14</sup>.

Patient satisfaction is essential for the success of any aesthetic procedure. The goal of any cosmetic treatment is not only to eliminate imperfections but also to increase patient satisfaction<sup>8</sup>. This concept is somewhat ambiguous and multi-dimensional. A satisfactory outcome can be highly individual<sup>15</sup>. Before performing any aesthetic treatment, it is of paramount importance to remember that these are elective procedures and should not be approached lightly<sup>16-18</sup>. A complete clinical history should always be taken and the interview should principally aim at knowing and understanding the "person-patient", carefully assessing his attitudes and expectations, through opinions, emotions and past experiences<sup>19,20</sup>.

In literature many studies to assess aesthetic procedure outcomes, and in particular, to compare the safety and effectiveness of different types of aesthetic treatments, are described<sup>6,21-23</sup>. However, an evident technical success often cannot necessarily be associated with a high level of patient satisfaction. No scientific evidence on the experience of a single surgeon over a wide period of time, which at the same time analyses the most important minimally invasive aesthetic pro-

cedures, are reported. The aim of this study is to analyze non-surgical rejuvenation procedures in a private practice setting, over a period of 10 years, focusing attention on patient satisfaction. The “degree of satisfaction” was calculated as the percentage of patients returning within 18 months of treatment, that is the time within which a cycle of treatment is concluded, considering that botulinum toxin type A (BTX) injections are performed about every 6 months, 4 months for hyaluronic acid (HA) injection and generally poly-L-lactic acid (PLA) injections are made 3 times in a years, with a year off before starting another cycle of injections. If the patient is satisfied, he wants to repeat the procedure, he shows good compliance to the treatment sessions and builds a good fiduciary link with the medical operator.

### Patients and Methods

A retrospective study was performed on the total sample of patients who received nonsurgical rejuvenation procedures in a cosmetic surgery practice. Four types of treatments were considered; botulinum toxin type A (BTX-A), hyaluronic acid (HA) and poly-L-lactic acid (PLA) injections, or a combination therapy (BTX-A and HA and/or PLA injections), administered from January 2003 to December 2012. All the injections were performed by the same author. Data was collected on gender, injected substance, facial region injected, the date of the first and last treatment and the number of treatments received. The outcome measures included the number of patients for each treatment for each year, treatment time interval, the number of treatments for each patient, the “degree of satisfaction”, calculated as the percentage of patients returning within 18 months of treatment, and the number of treatments according to facial subsite. Kaplan-Meier survival curves were estimated to determine sig-

nificant differences between the four types of treatments that affect patients’ satisfaction. Chi-square test was used to analyze the type of treatment relationship with patients’ satisfaction. All patients were treated at least a year before the study deadline to allow for proper follow-up data.

### Results

The 429 patients included 384 women and 45 men. The mean age of patients was 47.5 years (mean ± 4.8SD). The distribution of ages did not differ between the 4 groups. Distribution of patients in the different types of treatments is shown in Table I. On the overall sample selected, 33.1% of patients received BTX injections, (30.1% of the total women sample and 40.9% of total men sample), 20.5% of patients received HA injections and 9.6% of patients PLA injections. The most common treatment used in the practice was combination therapy (BTX with HA and/or PLA), 36.8% of patients. This trend was reversed for men, 41% of them would chose a treatment with BTX, while only 18% opted for the combination therapy.

Over the years we observed an increase of patients who requested these types of nonsurgical rejuvenation procedures until year 2008. From 2009 an inverse trend was observed, with a progressive decrease of patients and a minimum between 2008 and 2011. Looking at the temporal series by type of treatment we can see that from 2003 to 2008 the most requested treatments were BTX injections and combination therapy. Treatment with PLA injections, instead, shows a sharp decline in demand (from 15% to 9%), 2004 to 2012. In Table II the performances of the treatments during the 10 years of follow-up and the variation rate, that estimated the percentage change in the total number of patients from one year to the next, are shown.

**Table I.** Distribution of patients in the different types of treatments analysed.

Treatment	Patients	Patients (%)	Women	Women (%)	Men	Men (%)
Botulinum toxin	142	33.10	116	30.1	18	40.9
Hyaluronic acid	88	20.51	72	18.7	8	18.2
Polylactic acid	41	9.56	30	7.8	10	22.7
Combination therapy	158	36.83	167	43.4	8	18.2
Total	429		385		44	

**Table II.** Number of patients requiring one of the 4 types of treatment for each year.

Year	Botulinum toxin	Hyaluronic acid	Polylactic acid	Combination therapy	Overall	Variation rate
2003	0	6	7	6	19	
2004	21	4	4	17	46	142.1%
2005	28	3	8	14	53	15.2%
2006	21	3	4	24	52	-1.9%
2007	19	9	4	21	53	1.9%
2008	27	14	10	35	86	62.3%
2009	10	14	1	10	35	-59.3%
2010	8	15	2	20	45	28.6%
2011	3	10	1	7	21	-53.3%
2012	5	10	0	4	19	-9.5%
<b>Overall</b>	<b>142</b>	<b>88</b>	<b>41</b>	<b>158</b>	<b>429</b>	

The mean number of treatments for each patient is 3.5. The mean treatment time interval for patients that received more than one treatment was 4 months and half, in particular it was about 4 months for BTX injections, about 2 months for HA injections, about 3 months for PLA injections and 5 months for combination therapy. The mean time of treatment was 19 months, with a low of 0 days (patients performing only a treatment), and a maximum of about 10 years (3470 days). On the other hand the median time treatment is 6 months. In the follow-up the combination therapy had best performances. 75% of patients seeking this treatment still remained in the study over 6 months (184.8 days) and 50% of patients for more than 2 years (837 days). Regarding the other types of injections, 25% of patients remained in the study 6 months for the HA and 14 months for the BTX. After 6 months from the first treatment, 48% of patients still returned to the private practice (75% performed combination therapy). After 18 months, which is the time that we considered to attest a good “degree of satisfaction”, 34% of patients were still in the study (60% performed combination therapy, only 21%,

17% and 20% respectively performed treatment with BTX, HA and PLA). After 3 years of follow-up 23% of patients still continued injections (Table III).

According to the type of treatment and the total number of treatments received, it is possible to identify 4 main patient categories: “occasional patients” who required only one treatment, “sporadic patients” performing from 2 to 4 treatments, “discontinuous patients” receiving from 5 to 8 treatments and, finally, “assiduous patients”, paying more attention to appearance, who required more than 8 treatments (Table IV).

It is possible to observe that about 33% of patients received only one treatment, and no more than 50% of the sample returned to the practice after 6 months. In particular, 80% of patients performing only HA injections left the study after 6 months. Combination therapy had the best degree of loyalty. Six patients out of ten still performed this kind of procedure after 18 months from the first injection.

Kaplan-Meier survival curves were estimated to analyze the type of treatment relationship with patients’ satisfaction. These curves, estimated on

**Table III.** The main statistics of the time of permanence in the study for the 4 types of treatment (time is measured in days).

Statistics	Overall	Botulinum toxin	Hyaluronic acid	Polylactic acid	Combination therapy
Minimum	0	0	0	0	0
1 <sup>st</sup> Quartile	0	0	0	0	184.8
Median	154	0	3	68	837
Mean	579.80	421.1	208.4	277.2	1008
3 <sup>st</sup> Quartile	979	425.5	187.2	315	1516
Maximum	3470	2947	1946	1531	3470

**Table IV.** Number of injects received by each patient in the follow-up.

No. of treatments	Botulinum toxin	Hyaluronic acid	Polylactic acid	Combination therapy	Total
Occasional [1]	84	44	13	22	163
Sporadic [2-4]	35	29	18	79	161
Discontinuous [5-8]	13	10	8	35	66
Assiduous [> 8]	10	5	2	23	36

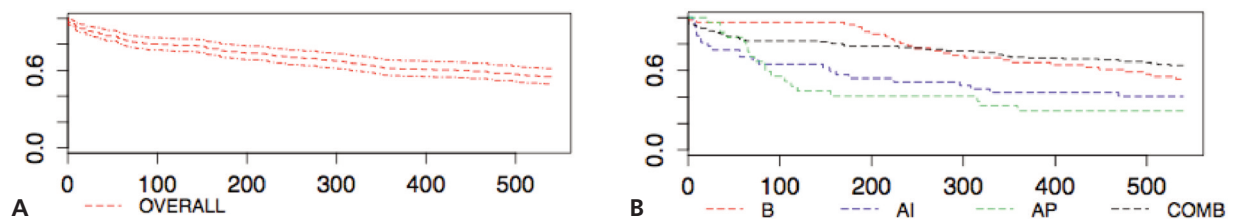
the sample of patients that performed at least 2 treatments, showed that after 18 months of treatment the probability that a patient still remained in the study was 55%. The curve slightly and linearly decreased. After 6 months, 75% of patients continued the treatment and after a year 60% of the patients were still in the study (Figure 1A). The second curve shows that combination therapy counted the major number of patients still in the study after 18 months, although, in the first 7 months, the patients requiring BTX injections were at a lower risk of living the study than those who performed the combination therapy. The treatments with HA and PLA injections suffered a high decline in the first 5 months, in which 40% of patients requiring HA injections left the study and about 40% of patients performing PLA injections still remained in the study (Figure 1B). The permanence time in the study depends on the type of treatment chosen ( $p$ -value = 0.000127).

The prevalence of injection subsites provides another indicator for treatment efficacy and patient's satisfaction. The most common botulinum toxin infiltrated subsites in order were glabellar lines, brow lines, crow's feet, lateral brow, bunny lines, lips and mouth frown. The most commonly HA injected subsites were the nasogenien grooves, the sublabial fold, the upper labium contour, the filter, the zygomatic region and the lower orbitary edge. Regarding glabellar lines, 279 patients performed at last one treatment on this area. Among them 125 patients received

BTX injections and 140 a combination therapy. However 263 patients received one of the 4 types of treatment on brow lines, among them 121 performed BTX injections (91.7% on total of patients that performed BTX injections and 46% on total patients performing treatments in this body area) and 128 a combination therapy. Finally, 219 patients received one of the 4 types of treatment in periocular area with a similar trend and 187 patients treated nasojugal folds (29.4% performed HA injection, 57.8% a combination therapy and only 4.8% BTX injections alone). A different trend can be noticed for cheeks. About 30% of patients that performed injections on this area chose PLA but combination therapy was always the preferred treatment (57% of overall patients injecting this area).

### Discussion

Botulinum toxin and dermal filler injections are now the most common nonsurgical aesthetic treatments performed worldwide<sup>24,25</sup>. They are typically associated with high patient satisfaction ratings<sup>6,20,26</sup>. In literature some studies on patient satisfaction following aesthetic procedures, and especially for BTX treatment, are conducted but no scientific evidence on a single surgeon experience in a wide period of time, analysing at the same time the most popular minimally invasive aesthetic procedures are reported<sup>20,27,28</sup>. The re-



**Figure 1.** **A**, Kaplan-Meier curves estimated on the total sample. **B**, Kaplan-Meier curves estimated for each type of treatment.

sults of this retrospective study comply with a world tendency as regards the increase in popularity and requests for these types of treatments and the high level of patient satisfaction<sup>29</sup>. From 2003 to 2008 the most requested procedure was BTX injection that had a peak in 2006. These results are in accord with the worldwide data that sees the infiltration of BTX-A as the most popular aesthetic procedure. Botulinum toxin for aesthetic procedures had had more than 500 percent increase since 2000 and was the most performed cosmetic procedure in the USA in 2006, with over 3 million patients receiving the BTX injections<sup>30</sup>. The end of BTX effect is immediately evident for patient who is encouraged to repeat the treatment as early as possible. HA injections, however, have a more lasting and natural effect and the patient forgets to immediately repeat the treatment, but often goes to the surgeon to treat other areas.

Since 2009, there has been an increase in patients who require infiltration of HA. Patients preferred HA injections for several reasons such as an immediate result, less pain and the lower price. According to American Society of Aesthetic Plastic Surgeons (ASAPS) published projected nationwide statistics HA fillers represented the most commonly used injectable substances in 2008<sup>30</sup>. The PLA treatment performances, instead, had a progressive drop in demand in the follow-up.

The cosmetic surgery setting reached its maximum in nonsurgical aesthetic procedures in 2008 with a later progressive decline. This phenomenon could be explained by an increase of not specialized physicians that offered nonsurgical procedures with more competitive prices. This trend resulted in an increase of unsatisfying outcomes and complications. In addition, the drop in demand of overall aesthetic procedures can be explained by the outbreak of the financial crisis in August 2007, with a recession and a serious industrial crisis, followed in 2009 by a generalized economic crisis with serious recession and vertiginous collapse of Pil in many countries of the industrialized world.

According to the type and the number of treatments performed, it is possible to identify 4 main patient categories: "occasional patients" who performed only one treatment, "sporadic patients" requiring from 2 to 4 treatments, "discontinuous patients" receiving from 5 to 8 treatments and, finally, "assiduous patients", paying more attention to appearance, that performed more than 9 treatments. To describe these differences between pa-

tients, we analysed the individual attitudes in the private setting, also through a telephone interview to patients who left the treatment required. "Occasional patients" were especially subjects not careful to aspect that by chance tried one of the treatments analysed in some cases after having been advised by a friend or relative. They often did not believe it would be useful to spend a lot of resources especially economic ones for aesthetic reasons, or were sometimes dissatisfied with unnatural-looks. "Sporadic patients" fall into a category with very similar features to the previous one. Patients defined as discontinuous probably are subjects more careful to exterior aspect that performed several treatments but were not constant because of economic reasons, social or personal problems and others. Finally, "assiduous patients" performed more than 9 treatments and probably this category included subjects paying more attention to physical aspect, which were more satisfied with aesthetic procedures. These patients believed in having a more youthful and natural look with no wrinkles.

Through a deeper analysis the reasons why patients' leave the treatment program are mainly economic, such as the advent of the economic crisis in general and the increased supply of cheaper treatments by not specialized physicians. Many patients were able to perform only one treatment through savings or others, but did not have the chance to return. We should not ignore patient expectation that can often interfere with the level of satisfaction. Patients should be informed of the risks, alternatives, and aftercare instructions and their expectations should be addressed prior to starting the treatment<sup>15</sup>. Often the patient is not well informed about the treatment features, they maintain high expectations and consider it too uncomfortable and expensive to repeat the treatment in the recommended intervals. A smaller part of patients withdrew from undertaken treatment because of health or family issues that result less relevant on the overall sample. Finally, the potential complications that may occur in minimally invasive procedures, should be described in detail in the first patient interview, before written consent has been obtained. Fillers have excellent safety profiles, with rare side effects often procedural or technique related<sup>12,30</sup>. The most common BTX side effects, such as headache, diplopia and ptosis are temporary, usually resolving within 2 to 4 weeks<sup>27</sup>. In the ten years of experience, major complications were not observed in our cosmetic surgery practice.

Occasionally patients receiving BTX injections complained of a mild headache, which resolved after a few days and did not significantly interfere with patient satisfaction.

## Conclusions

In this study patients' continuity over time in participating in a treatment program was used as an indicator for the patient satisfaction. After 18 months, that is the time that we considered to attest a good degree of satisfaction, 55% of patients were still in the study. Combination therapy was the type of non-surgical rejuvenation procedure which had the best performance. Six patients out of ten still required this treatment after 18 months from the first injection. In this manuscript, the authors have no intention of claiming a universal method to assess a complex and multi-dimensional concept such as patient satisfaction, but, through ten years of experience, they have tried to analyse the variables affecting it, and the means that the surgeon has at his disposal to improve the satisfaction, compliance, and therefore the loyalty of the patient to a type of aesthetic treatment. Understanding the patient allows us to predict his behaviour, to modulate expectations and increase compliance to our prescriptions. In this way he can take full advantage of the treatment and satisfaction will increase the level of loyalty to that type of procedure. Clinicians should educate their patients so that they will have realistic expectations and be able to make informed choices. When patients are satisfied with their outcomes, they do not hesitate to give a positive feedback to the clinician, to refer to friends, and to return for additional treatments.

## Conflict of Interest

This manuscript has no actual or potential conflict of interest including any financial, personal or other relationships with other people or organizations within three years of beginning the submitted work that could inappropriately influence, or be perceived to influence, their work.

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