


# Complications Following Self-Administration of Hyaluronic Acid Fillers: Literature Review

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**Abstract:** The purpose of the present study is to review published literature regarding complications following self-administration of hyaluronic acid (HA) filler. The following keywords were searched in Pubmed and Cochrane database: filler AND self injection, hyaluronic acid AND self injection; filler AND self administration; hyaluronic acid AND self administration. Two authors performed title and abstract eligibility assessment independently. Gray literature and all articles cited in the included papers were also screened and their reference lists were examined to identify other potentially pertinent studies. Non-English papers were excluded. A total of 4 complications following self injection of HA were identified. Conversely, after performing a general search through the Google Internet search engine, with the item "self-injection of hyaluronic acid filler", there were 604,000 hits. The number of articles reporting complications after the self administration of HA is few. Despite that internet searches on the same topic shows that self-administration of HA fillers is a widely discussed phenomenon in several on-line forums. The present review suggests that complications after self-injection of HA are an under-reported phenomenon.

**Keywords:** self-administration, DIY, self-injection, complication

## Introduction

The demand for non-invasive facial aesthetic procedures has increased dramatically in recent years. In 2018, more than 1 billion dollars were spent on injectable treatments by consumers.<sup>1</sup> Injection of hyaluronic acid (HA) was the second most popular nonsurgical cosmetic procedure (after botulinum toxin injection) with over 800,000 treatments performed, an increase of almost 12% from 2017 to 2018 and a 60% increase from 2014 to 2018.<sup>1</sup>

It is thought that the increasing social pressure placed on the younger generation via social media has been driving the overwhelming demand for cosmetic procedures. Moreover, video platforms have helped to spread practical knowledge on the execution of such procedures. Although most of these videos are supposedly addressed to practitioners, the free and easy availability allow people to watch, compare and reenact them.

Social media and the internet are not the only devices that have caused the normalisation of cosmetic procedures. Platforms for the treatment to be marketed are provided.<sup>2</sup> Technology has opened the doors to easy accessible and unregulated forums where self-injectable fillers can be bought easily. Alarming, the general public's awareness to the risks of dermal fillers injections appears to be lacking.

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The purpose of the present review is to attest the incidence of reported complication after self-injection of HA filler.

## Materials and Methods

In order to attest the incidence of complications after self-administration of HA fillers, the research was carried out on electronic databases, PubMed and Cochrane databases identifying articles from January 2000 to July 2020. The search was conducted up to July 17th, 2020. Articles language was limited to English using databases supplied filters. The following keywords were searched: filler AND self injection, hyaluronic acid AND self injection; filler AND self administration; hyaluronic acid AND self administration.

Two authors performed title and abstract eligibility assessment independently. Disagreements between authors were resolved by consensus. When consensus was not reached, a senior member mediated. Gray literature and all articles cited in the included papers were also screened and their reference lists were examined to identify other potentially pertinent studies. Non-English papers were excluded.

## Results

The online search yielded 712 records from Pubmed database and 169 from Cochrane Library database (Tables 1 and 2). As inclusion criteria were considered all the papers reporting complications following self administration of HA filler; all kinds of studies were considered, including case reports. Non-English papers were considered as exclusion criteria.

After screening the articles by titles and abstracts: a total of 10 articles were considered relevant and selected for full-text reading. Scanning of Gray literature and citations of included studies yielded no further relevant result. Among the 10 papers considered for the present review, 6 did not meet the inclusion criteria and were consequently excluded. The remaining 4 articles underwent critical evaluation and selected for data collection. All selected papers were case reports. A total of 4 complications following self injection of HA were identified.

## Discussion

When performing a general search through the Google Internet search engine, with the item “self-injection of hyaluronic acid filler”, 604,000 hits comes out; furthermore, looking for the most frequent related questions posed, results shows: “Can I inject hyaluronic acid

myself?”, “Can you inject yourself with fillers?”. An interesting point is that the answer to the first question, extracted from the most relevant site for that query, is

Self-injecting is not forbidden, but we must kindly warn you that it may lead to disappointing results. If you want to treat yourself with Hyaluronic acid, make sure that a subcorrection always looks better than an overcorrection;

for the second question the answer is

Please don't try to inject yourself with facial fillers - it is extremely dangerous! [...] Without knowing the anatomy of face muscles, nerves and blood vessels you could cause irreversible facial paralysis, blindness and tissue necrosis.

Self-injection of HA filler is a widely discussed phenomenon in several on-line forums both in the Italian and English language. Specific sections can be found regarding Do-It-Yourself (DIY) skincare and cosmetics procedures, with hundreds of patients sharing their own experiences on HA filler self-injection, including video tutorials and advice regarding the procedures and how to buy it online. The posts span from 2009 to the present day, leading us to think that self-injecting of HA filler is a widely used procedure.<sup>3-6</sup>

Conversely, the present literature review showed a significant low incidence of reported complications following self-administration of HA filler: only 4 case reports have been published.<sup>7-10</sup>

Three of these case reports referred to facial injection and one to penis injection; in all the cases HA filler was bought on the internet. Regarding self-administration of facial filler, one paper presented the clinical case of a woman who was referred to the hospital with a 4-week history of suspicious upper lip swelling. A conservative approach was proposed to the patient and self-reduction of the clinical condition was observed within 2 months.<sup>10</sup> Another paper presented a patient suffering from swelling around the nasolabial fold, which she had since her self-injection filler 10 months previous. The case was treated with hyaluronidase injection.<sup>7</sup> One more paper presented a patient with erythema and lumpiness around self-injection sites, also in this case resolved with hyaluronidase injection.<sup>9</sup> The last paper considered, described a penis injection with HA and the development of indurated, erythematous nodules on the entire penile shaft, glans penis and scrotum. Only medical therapy, during a 3-day hospitalisation, was administered.<sup>8</sup>

**Table 1** Pubmed Search Results

| Keywords Search on Pubmed               | Articles | Suitable After Title and Abstract Screening | Suitable After Text Reading |
|---|----------|---|-----------------------------|
| Filler AND self injection               | 100      | 9   | 4                           |
| Hyaluronic acid AND self injection      | 259      | 1   | 0                           |
| Filler AND self administration          | 62       | 0   | 0                           |
| Hyaluronic acid AND self administration | 291      | 0   | 0                           |

**Table 2** Cochrane Library Search Results

| Keywords Search on Cochrane Library     | Articles | Suitable After Title and Abstract Screening |
|---|----------|---|
| Filler AND self injection               | 27       | 0   |
| Hyaluronic acid AND self injection      | 73       | 0   |
| Filler AND self administration          | 14       | 0   |
| Hyaluronic acid AND self administration | 55       | 0   |

The complications reported in the present review appear to be related to poor injection capability; however these complications can be also seen when injection is performed by a medical doctor who demonstrates poor practice in the injection of HA. High-risk complications did not arise in the present review.

The comparison between the high numbers of tutorials and forums regarding self-injecting of HA filler and the low number of articles present in the current literature, showing complications after self-injection, leads one to think that this is an underestimated phenomenon. The first case report of self-injected HA was published by Ono and Hyakusoku in 2010.<sup>7</sup> The authors also performed a sort of “mini review” of literature regarding this topic, underlining that several materials, such as olive oil, automobile transmission fluid, mineral oil, sweet almond oil,<sup>11-15</sup> have been described to be self-injected to improve facial appearance, but no cases were reported in literature

regarding complications following self-injected HA prior to their paper.<sup>7</sup>

Moreover, most of the patients in previous self-injection case reports of various substances, had a history of psychosexual problems and had engaged in frequent, repeated self-injections. Ono and Hyakusoku stated it is extremely unusual for an individual without any history of psychological illness to self-inject for rejuvenation purposes.<sup>7</sup>

However, as shown by common internet searches, it looks as if a large number of patients are looking up how to self-inject. Several individuals admit to self-injecting with no anaesthesia, and suggest cooling the product with a refrigerant to reduce pain during injection; some others suggest applying aesthetic cream or haemorrhoid ointment; moreover, others claim to repeatedly use the same needle, keeping the surplus material in refrigerator for a couple of months. According to these patients, they can inject the materials just as well as a physician, and at a reduced cost. They are fearful about government restrictions on purchasing these products.

The US Food & Drugs Administration strictly regulates dermal filler commercialisation: only approved fillers can be sold to licensed doctors in specific clinical settings and lists unapproved uses and general risks, underlining that “Having filler injected should be considered a medical procedure, not a cosmetic treatment.”<sup>16</sup>

The European Union Medical Device Regulation (MDR (EU) 2017/745) repealed the existing directives indicating the general and essential requirements that a medical device should have homogeneity among European Union countries. Its implementation was postponed to May 2021 due to Covid-19 outbreak. Authorised notified bodies assess and certify medical devices. Once the certification is given, in order to be commercialised in Italy, such devices are registered in a Ministry of Health data bank with technical and administrative information of each device. Resorbable dermal fillers are classified as Class III risk since they suit the Rule 7 statement “have a biological effect or are wholly or mainly absorbed [...]”. Although the notified body needs to thoroughly assess the design and production of the products based on efficacy and safety clinical data, there are currently no strict rules on selling and administration of such substances, since both resorbable and non-resorbable fillers are not classified as drugs but as medical devices.<sup>17,18</sup>

In 2018, Brennan et al<sup>19</sup> performed an online study describing the use of DIY Botox and dermal filler

phenomenon discussed on Internet forums. In this study, Brennan identified 5 interesting themes: Motivation to Self-Inject DIY Botox and Dermal Filler Kits; Sourcing; Injecting Practice; Outcomes; Risk Perceptions.

Motivations to self inject were mainly identified in improving appearance of lines and wrinkles and avoiding financial cost. Sourcing routes were identified via discussion threads, ordering in bulk was common. Injecting practice was mainly displayed through YouTube tutorials. Regarding the outcomes, several positive outcomes of DIY procedures were posted to enhance this practice. Last but not the least, the risk perception was high, associated with the fear of negative outcomes, although the high costs of professional treatments were a good motivation to engage in the risk.

The paper published by Brennan et al<sup>19</sup> shows exactly how widely diffused the self-injecting phenomenon is, so the question is “why in medical literature are such small numbers of paper presenting complications following self-injecting filler present?”

A clear explanation regarding the aforementioned question does not exist, however we could hypothesise that individuals looking for self-injecting filler avoid injecting deeply into facial layers and probably this could let to have only minor complications such as ecchymosis, lumpiness or overfilling. Moreover, it is possible that in case of complications, individuals feel ashamed to refer to a physician to resolve the problem, furthermore because it is well known by patients that HA naturally resorbs within a number of months.

The concern in medical literature arose almost 10 years ago, with the editorial published by Pickett in 2011: “Serious issues relating to counterfeit dermal fillers available from Internet sources”, nonetheless, the number of reported complications following self-injection of HA filler is low.<sup>20</sup>

The self-injecting phenomenon is also advocated by the online availability of filler, especially the ones containing HA. The Ministry of the Health and regulatory orders should take care about online selling of these medical devices and avoid a wide distribution among non-professional users.

## Conclusion

In the present paper a review of complications following self-administration of HA fillers was performed; the number of reported complications is low although internet searches regarding the same topic show that self-administration of HA fillers is a widely a discussed

phenomenon in several on-line forums. The low number of reported complications could be related to 2 main points: the subject first wanted to avoid a medical consultation (to save costs), and secondly felt ashamed to go to a physician after it went wrong.

Another interesting point arisen in the present review is the wide availability on line of HA filler. Ministry of Health and regulatory should restrict orders only to medical doctors in order to stem the underreported self-injection phenomenon.

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