

Case Report

Early Cervical Nodule Formation Following Poly-D,L-Lactic Acid Injection: Ultrasound Findings, Technical Considerations, and Practical Lessons From Clinical Practice

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ABSTRACT

Poly-D,L-lactic acid (PDLLA) is increasingly used as a collagen-stimulating injectable with a favorable safety profile. However, reports of nodules associated with PDLLA remain limited, particularly in anatomically sensitive areas such as the neck. We report a case of early, asymptomatic cervical nodules occurring after PDLLA injection, characterized clinically and by high-resolution ultrasound. The case is discussed in the context of injection technique, anatomical considerations, and real-world procedural factors that may predispose to product accumulation. This report highlights that early nodules following PDLLA injection may reflect technical deposition rather than inflammatory or granulomatous reactions. Awareness of neck anatomy, careful handling of PDLLA suspensions, and the use of ultrasound can aid in accurate diagnosis and prevention of similar events.

INTRODUCTION

Poly-D,L-lactic acid (PDLLA) is a biodegradable polymer composed of a racemic mixture of D- and L-lactic acid monomers, resulting in an amorphous structure distinct from the crystalline properties of poly-L-lactic acid (PLLA) or poly-D-lactic acid (PDLA) (1). In aesthetic dermatology, PDLLA has gained popularity as a collagen-stimulating injectable for volume restoration and improvement in skin quality, with an overall favorable safety profile (2).

In everyday clinical practice, PDLLA is relatively easier to handle compared with earlier PLLA formulations. This perception, while largely justified, can inadvertently lead to an underestimation of risk, especially with anatomical variables, where improper technique might cause complications in thin-skin areas & hypermobile tissues, such as the neck.

Reports of PDLLA-related nodules are scarce. Only isolated cases have been described, involving the lower face, tear trough, and neck, with varying hypotheses regarding granulomatous reactions, inappropriate product selection, or migration (3-5). Importantly, few reports provide imaging-based confirmation of product location or discuss practical injection-related factors encountered in routine practice.

CASE PRESENTATION

A 43-year-old woman presented with visible, asymptomatic nodules along the cervical angle three weeks after receiving PDLLA injections. She had a history of well-controlled hypothyroidism treated with levothyroxine (50 µg daily) and was otherwise medically fit. She had no prior injectable treatments to the neck.

On the treatment day, PDLLA (AestheFill®, REGEN Biotech, Seoul, South Korea) was injected into three anatomical regions: the dorsal hands, the upper neck, and the lower face. Three vials (200 mg each) were used. Each vial was diluted with 9 mL of sterile water for injection and 1 mL of 2% lidocaine, following the D10 dilution protocol described by Lin et al. (7). Mechanical mixing was performed using a vortex device.

All injections were administered by the same experienced injector using a 22-G cannula with a fanning, retrograde technique. The intended injection plane was subdermal in all areas, verifying depth was done by manipulating the cannula, checking for tethering to the dermis. Real-time ultrasonic guidance was not available. Manual massage was performed for approximately five minutes per site immediately after injection using an arnica-based gel. No post-procedure home massage instructions were provided.

The patient reported feeling small lumps in the neck region from the day of treatment, although they became more noticeable visually over the following weeks. The injected facial and hand areas healed uneventfully, with no nodules or inflammatory changes.

CLINICAL AND ULTRASONOGRAPHIC FINDINGS

On examination, multiple firm nodules were visible bilaterally along the cervical angle. The overlying skin appeared normal, without erythema, warmth, or tenderness. Palpation confirmed well-defined, non-tender subcutaneous masses.

High-resolution ultrasonography was performed using a Philips Lumify™ system with an L12–4 MHz linear transducer, musculoskeletal preset, and a depth of 3.5 cm. Imaging demonstrated well-circumscribed anechoic accumulations located deep to the platysma, within the sub-platysmal fat layer (Figure 1). These findings were consistent with localized product deposition rather than inflammatory granuloma or abscess formation.

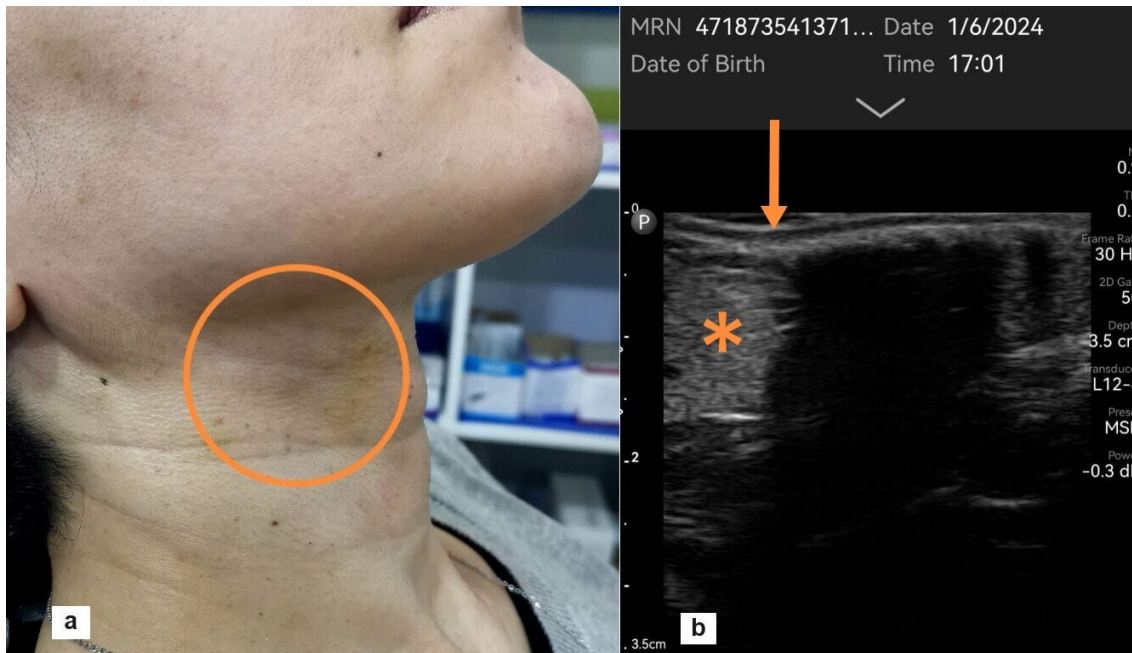


Figure 1. Nodule in a 43-year-old female. a: Clinical appearance of the patient's neck. b: Ultrasonographic findings: the arrow points to hyperechoic dermis (immediately under which is the proper plane), star is the sub-platysmal fat, in it a well-defined anechoic block is evident.

MANAGEMENT AND OUTCOME

Given the absence of established guidelines for managing PDLLA-related nodules and the non-inflammatory nature of the findings, a pragmatic treatment approach was adopted. Intralesional hyaluronidase (450 IU total per session, diluted to 150 IU/mL) was administered, combined with instructions for regular manual massage three times daily. Two sessions were performed ten days apart.

It is acknowledged that hyaluronidase does not enzymatically degrade PDLLA. Therefore, the observed clinical improvement over the subsequent weeks is more plausibly attributed to mechanical dispersion, massage-assisted redistribution, hydration alongside matrix loosening by hyaluronidase, and natural

integration rather than a direct pharmacologic effect on the PDLA molecules. At the 6-week follow-up, no palpable nodules remained.

DISCUSSION

Complications associated with PLLA, including delayed nodules and granulomas, are well documented, and the neck has been recognized as a higher-risk injection site (8, 9). In contrast, PDLA-related complications are less frequently reported, which may reflect both its newer adoption and underreporting of mild or self-limited events.

In the present case, several practical considerations merit emphasis.

First, the neck represents a unique anatomical region. Tissue mobility, thin subcutaneous layers, and proximity to deeper planes mean that even experienced injectors may inadvertently place product deeper than intended, particularly when using cannulas, element of poor spacial dispersion probably aided accumulation. The ultrasound findings in this case strongly suggest deposition within the sub-platysmal fat rather than the intended subdermal plane.

Second, real-world handling of PDLA suspensions may influence outcomes. After dilution, PDLA particles tend to precipitate over time. In routine clinical settings, syringes may be prepared in advance and left stationary for several minutes. Re-agitation immediately before each injection pass is critical, otherwise uneven particle distribution may occur, increasing the risk of localized accumulation (Figure 2).

Third, the absence of inflammation, tenderness, or delayed onset argues against a granulomatous reaction, which has been proposed in earlier reports (3). The early post-injection period (2-4 weeks) is insufficient for a granulomatous process to mature; tissue response would be in its early phase.

We believe this presentation is a case of technical deposition, similar to cases in which ultrasound has confirmed filler accumulation rather than immune-mediated complications (4, 5).

The reported treatment approach was empirical; other options in case nodules did not respond included intralesional injection of steroids / 5-FU, but this proved unwarranted.

Finally, this case underscores the growing value of aesthetic ultrasound. Without imaging, such nodules may be misclassified, leading to unnecessary or inappropriate interventions. Ultrasound allows accurate localization and more informed clinical decision-making.



Figure 2. Appearance of the D10-diluted AestheFill® syringe 5 minutes after preparation.

CONCLUSION

Early nodule formation following PDLA injection in the neck may reflect technical and anatomical factors rather than inflammatory or granulomatous reactions. This case highlights the importance of adapting injection technique to regional anatomy, ensuring proper suspension handling, and utilizing ultrasound for diagnostic clarification. Sharing these practical insights may help reduce similar complications in routine aesthetic practice.

Abbreviations

PDLA: Poly-D,L-lactic acid

PLA: Poly-L-lactic acid

PDLA: Poly-D-lactic acid

PLA: Poly lactic acid

SWFI: Sterile water for injection

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Conflict of interests: None

Consent was obtained from the patient by Dr. Ghazzawi

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