

# Insulin-derived amyloidosis

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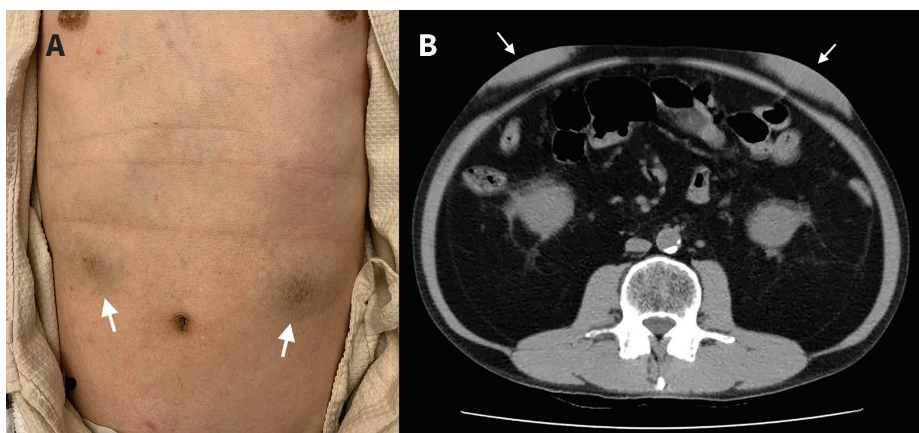
■ Cite as: *CMAJ* 2022 December 5;194:E1616. doi: 10.1503/cmaj.220531

A 52-year-old man with type 2 diabetes mellitus presented for a routine examination. He had been treated with insulin glargine and insulin aspart for 9 years. His total insulin requirement had gradually increased over the previous several years to 192 units (glargine 40 units, aspart 152 units) per day. Despite requiring high doses of insulin, his glycated hemoglobin (HbA<sub>1c</sub>) level was 9.7%. His body weight was 45 kg and his body mass index was 18.

Physical examination of the abdomen revealed 2 slightly firm, painless nodules with overlying discoloration at the sites used by the patient for his insulin injections (Figure 1A). Computed tomography (CT) of the abdomen showed ill-defined, irregularly shaped subcutaneous masses with a higher density than the surrounding adipose tissue (Figure 1B). Based on the patient's history and the CT findings, we diagnosed insulin-derived amyloidosis. We advised the patient to inject a lower dose of insulin at different abdominal sites each time, and his total insulin requirement subsequently decreased to 48 units per day. Thereafter, he was lost to follow-up.

Insulin-derived amyloidosis, also known as insulin ball, is a subcutaneous amyloid mass at the site of repeated insulin injections.<sup>1</sup> Because patients may find injections to be less painful at the site of the amyloidosis, some inject directly into them instead of at a new site.<sup>1</sup> Insulin absorption at sites of insulin-derived amyloidosis is about one-third of that compared with other sites.<sup>2</sup>

Insulin-derived amyloidosis is uncommon and is often misdiagnosed as insulin injection-associated lipohypertrophy, which occurs in as many as 50% of patients.<sup>1</sup> Ultrasonography, CT and magnetic resonance imaging may be used to distinguish between the 2 entities; however, a definitive diagnosis can only be made histologically.<sup>3</sup> Both conditions can be managed by rotation of injection sites. Amyloidosis often regresses slowly after insulin injections are stopped, whereas lipohypertrophic lesions tend to resolve more quickly.<sup>1</sup> Patients presenting with unexplained, worsening glycemic control should have their injection sites examined and blood glucose levels monitored regularly.



**Figure 1:** (A) Photograph of a 52-year-old man with insulin-derived amyloidosis, showing discoloration (arrows) on his right and left upper abdomen, overlying 2 palpable nodules. (B) A computed tomography scan of the abdomen showing bilateral, irregularly shaped, dense lesions on the bilateral anterior abdominal wall at the site of insulin injection (arrows), with no surrounding inflammatory change, consistent with subcutaneous amyloid deposits. The posterior lateral margins of the mass are ill-defined, and the average density of the lesions is 53 Hounsfield units with minimal enhancement.

## References

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**Competing interests:** None declared.

This article has been peer reviewed.

The authors have obtained patient consent.

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**Acknowledgement:** The author thanks Mr. James R. Valera for his assistance with editing the manuscript.

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