

Skin Complications with Perpendicular Placement of Insulin Infusion Catheters in Children

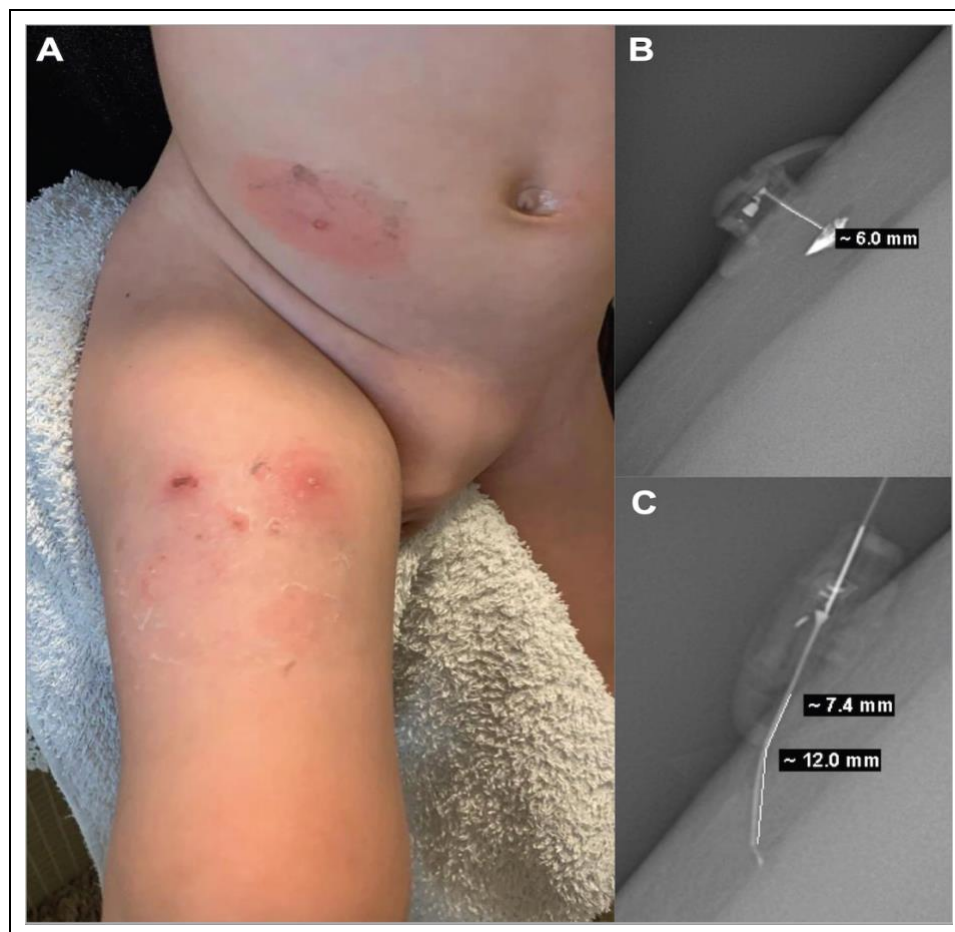
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Received: January 16, 2022; Accepted: January 24, 2022; Published: February 16, 2022



Clinical Image

An 18-month-old boy diagnosed with type 1 diabetes at nine months started insulin pump therapy soon after diagnosis. A perpendicular insulin infusion catheter was sited due to the lack of subcutaneous tissue, and his parents were well trained to handle the device. Between June and August 2020, while the child was on holiday at the seaside, he developed recurrent staphylococcal skin infections at the catheter insertion site (A). All these episodes were associated with high blood glucose levels requiring insulin injections to normalize blood glucose levels. On one occasion, he developed a one-day fever that was treated with oral antibiotics. Despite frequent catheter changes, staphylococcal skin infections continued to occur. However, when the perpendicular cannula was replaced with a 45° cannula, the infections resolved and no more occurred.

That summer, we saw skin infections at the insertion site of perpendicular catheters and severe hyperglycemia in five more children with type 1 diabetes under six years of age. Replacement with a 45° angle catheter was associated with recovery in every case.

The skin complications may have occurred due to continuous vertical dislodgements of the catheter due to sweat, sea salty water, intense physical activity, high temperature changes, or abrasion from sand.

To investigate this further, we imaged the authors' arms with contrast to compare the siting of perpendicular (B) and 45° (C) catheters. The 45° placement enabled the use of a longer cannula (19 vs. 4 mm) and, furthermore, a 45° angle of insertion prevented vertical movement of the infusion set. In these very particular situations, a 45° catheter seems to be a reliable way to manage young children with diabetes. Further studies are now needed to define practical recommendations for the use of insulin infusion catheters in type 1 diabetes in different environments, such as at the beach, in children.