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## Breast Imaging

## Supraclavicular lymphadenopathy after COVID-19 vaccination in Korea: serial follow-up using ultrasonography

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## ABSTRACT

We present serial sonographic findings of a case of supraclavicular lymphadenopathy that occurred after COVID-19 vaccination. Ipsilateral lymphadenopathy near the vaccine injection site following COVID-19 vaccination is a rather uncommon but expected adverse reaction. While axillary lymphadenopathy is more common, cases of supraclavicular lymphadenopathy in the setting of recent vaccination against COVID-19 are also being reported. Radiologists as well as referring physicians should be aware of this self-limiting process along with its ultrasonographic features and manage patients conservatively rather than performing an unnecessary immediate biopsy.

## 1. Introduction

Vaccination against COVID-19 is currently being performed worldwide. Recognizing possible adverse reactions associated with this vaccination is mandatory for clinicians to distinguish expected transient responses following vaccination from actual pathologic processes. Several recent articles reported lymphadenopathy ipsilateral to the vaccination arm after COVID-19 vaccination, especially mRNA vaccines (i.e. Pfizer–BioNTech and Moderna vaccines).<sup>1–4</sup> Most of them were axillary lymphadenopathy and less commonly supraclavicular lymphadenopathy. This case report presents a patient with supraclavicular lymphadenopathy after COVID-19 vaccination and associated ultrasonographic features seen in serial follow-up.

## 2. Case description

A 36-year-old female patient visited our hospital due to palpable lesions in the left supraclavicular area. She had been complaining of discomfort in the left lateral and posterior neck for a week. The patient had swelling local inflammatory symptoms and tenderness, but no systemic symptoms such as fever or malaise. She did not have any prior medical history including cancer. Ultrasonography revealed multiple (>five) lymph nodes, which had a short-axis diameter of 0.7 cm or less, at level V (posterior triangle) of her left neck, especially in the

supraclavicular area. The lymph nodes were round (short-axis/long-axis ratio greater than 0.5) and showed a thickened cortex with loss of normal fatty hilum and an ill-defined border with perinodal fat hyper-echogenicity (Fig. 1A, B). There were no abnormal lymph nodes in the right supraclavicular area or other lymph node levels of the neck. Several ( $\leq$ five) normal lymph nodes with small size ( $<0.5$  cm in short-axis diameter) and without abnormal morphology were observed in bilateral axillae, more of them on the left side. Possibility of lymphadenitis and even Kikuchi disease was suggested considering that the patient was an Asian female and there was unilateral nodal involvement at level V. Ultrasonography-guided core needle biopsy of the supraclavicular lymph nodes was performed. The lymph nodes were mobile while performing the biopsy. Pathological results showed reactive inflammatory signs with predominant small mature T-lymphoid cells with small mature B-lymphoid cells and a negative Epstein–Barr virus-encoded small RNA result.

Further investigation revealed that the patient had received an intramuscular administration of COVID-19 vaccine (Pfizer–BioNTech) on her left arm 17 days before detecting palpable lymph nodes in the left supraclavicular region, where she had been experiencing discomfort for a week. Therefore, we considered that the supraclavicular lymphadenopathy occurred 10 days after the vaccination as an adverse reaction following immunization. She did not have any other adverse reaction including fever, chills, or myalgia following the vaccination. The patient

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