LETTER TO THE EDITOR

Low Cost, Environment-friendly Ultrasound Phantom for Ultrasound-guided Regional Anesthesia: A Novel Model

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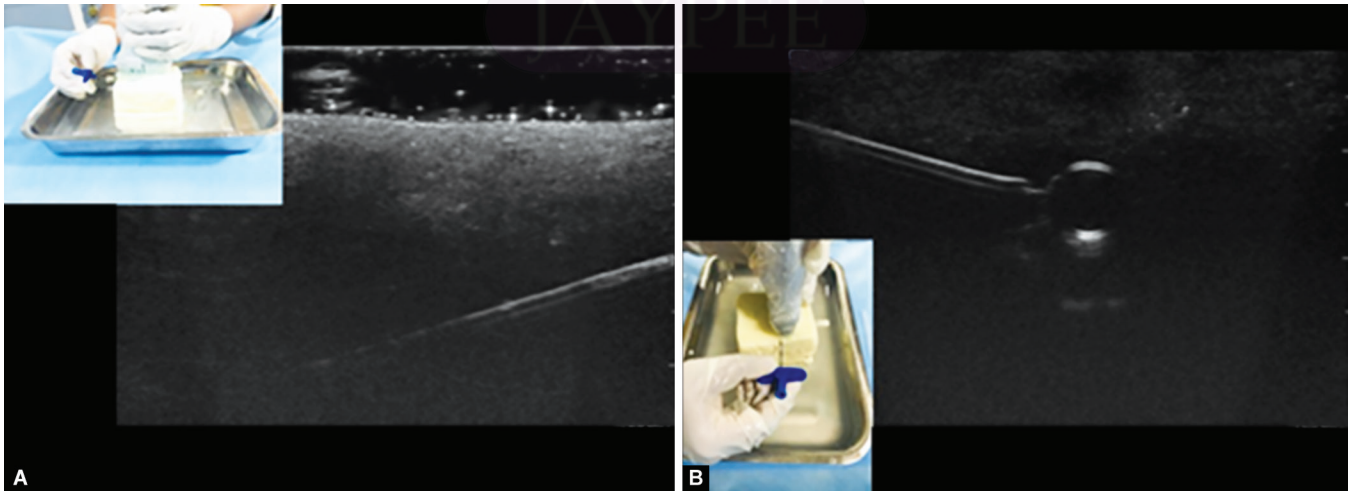
Precise needling technique and approach to target structure are two important component in ultrasound (USG)-guided nerve blocks. This skill is acquired over many years of practise or a trial and error method, done directly on patients.[1] This can cause considerable patient discomfort and may also lead to complications. Various simulators are available for teaching a particular skill to a novice candidate. This helps them to attain a certain expertise before performing on patients. Ultrasound phantoms are useful for repeated training of a particular skill like intravenous access or USG-guided nerve blocks. Commercially available phantoms are of high quality and reusability, but are very expensive and mostly imported product.[2]

To overcome these disadvantages, many indigenous low cost phantoms are made with easily available products. Poultry meat, animal fat, tofu and gelatin-based models are some of the products used to create these phantoms. Several studies have compared the different models with respect to USG penetration, target identification, needle visibility and shelf-life, safety and many more attributes.

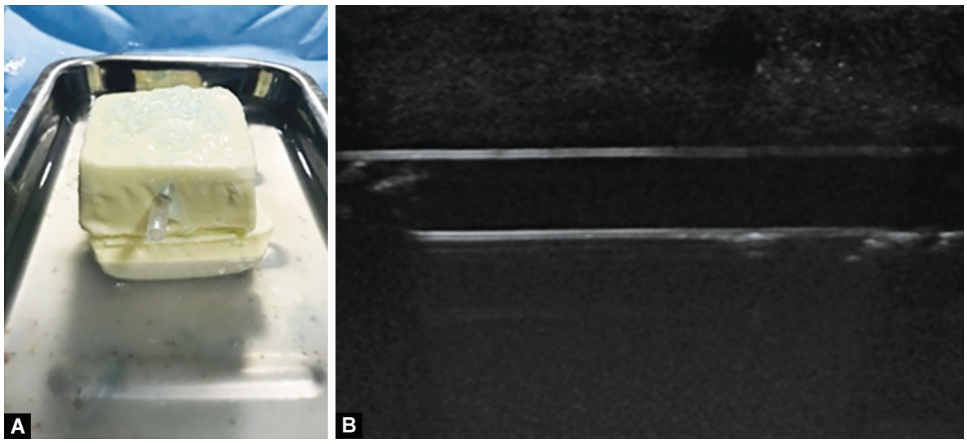
Animal products may harbor dangerous microorganism and gelatin phantom requires time for preparation and refrigeration.[3] Tofu (soy protein) model is widely used in certain countries.[4] But tofu is not commonly consumed by our people and may not easily available in many parts of our country.

In search of an alternative model to practise needling techniques, we used local cottage cheese—PANEER as USG phantom. This product, made of milk protein, is widely consumed by Indian population and easily available in India. Similar to tofu, paneer is low cost, firm, portable, environment-friendly, echogenic for USG waves (Fig. 1). Miniature objects can be inserted in the model and placed in water bath, to mimic blood vessels and tissue structures (Fig. 2).

Limited needle passes, requirement of a water bath, refrigeration prior to use, short shelf- life and uniform echogenic appearance are some of drawbacks in our paneer model. But nevertheless, we have successfully trained fellows and postgraduates for needling techniques using this model. It can be a good alternative in training centers where access to commercially available phantoms may be difficult. Further studies needs to be done to objectively compare the properties of paneer model with other models to emphasize its use.



Figs 1A and B: Needle visibility and echogenicity of paneer model



Figs 2A and B: Miniature targets inserted in the paneer model mimicking blood vessels

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