

## Potential threat of meningitis from ampoule impurities: Prevention is always better than cure!

Sir,

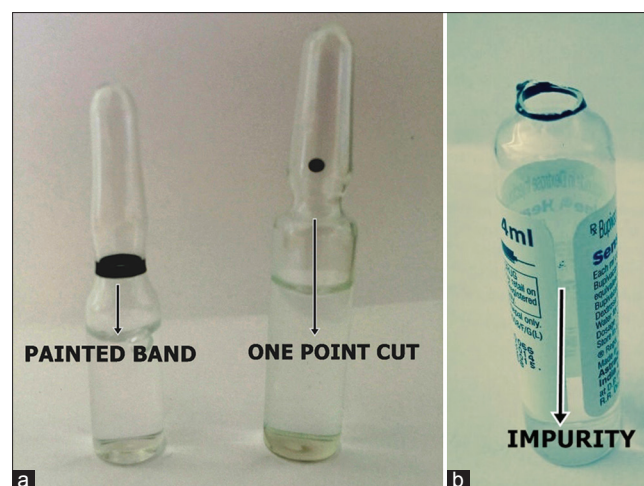
Spinal anaesthesia mandates adherence to strict asepsis to prevent potentially dreaded complications such as meningitis. Ampoule impurities can be a potential cause of breach in asepsis. Here, we report an incidence of macroscopic ampoule impurity while loading the local anaesthetic for subarachnoid block.

Local anaesthetics used for spinal anaesthesia are usually available in a single use glass ampoule. Few properties that are responsible for its wide use are excellent chemical resistance, impermeability and ability to tolerate sterilisation process. Problems encountered due to the use of glass ampoules are micro particles contamination and occupational risk due to percutaneous injuries while trying to break open the ampoule. To prevent percutaneous injury, mechanisms such as one point cut (OPC) and 'rupture disk' have been developed. In the OPC system, a small incision is made in the neck or strangulation point of the ampoule, between the head of the ampoule and the body. A small dot placed a few millimetres above the incision indicates the correct orientation for snapping the ampoule open.<sup>[1]</sup> In the 'rupture disk' system, an area of fragility is caused

at the strangulation point using a temper process that partially penetrates the glass causing an area of fragility or weak point. A band is then painted at the strangulation point, indicating its point of weakness<sup>[1]</sup> [Figure 1a].

In our case, a fragment of paint from the band accidentally fell into the local anaesthetic solution, while trying to break open the ampoule [Figure 1b]. As the impurity was detected before loading the local anaesthetic solution, the ampoule was discarded and a fresh ampoule was used.

Contamination of ampoule with micro particles has been a constant concern among the healthcare providers and has been reported for a long time.<sup>[2]</sup> In the incident that



**Figure 1:** (a) 'Rupture disk' system and one point cut system. (b) Impurity detected in the local anaesthetic solution

we report, a visible particle of paint has contaminated the local anaesthetic solution. This not only exposes the patient to the risk of infection and meningitis, but also to a risk of organic reaction due to the injected particle. Meningitis following subarachnoid block has been reported before.<sup>[3,4]</sup> Meningitis can occur either due to a breach in asepsis during the procedure or due to the presence of pre-existing bacteraemia in the patient at the time when spinal is performed.<sup>[5]</sup> Though aseptic causes are more likely, the occurrence of septic meningitis is not uncommon.

Strong adherence to asepsis can prevent purely iatrogenic complications such as meningitis from developing. It is preferable to use OPC system as an aid to snap open the ampoule in drugs intended for spinal and epidural use. Even if drugs are loaded from ampoules that have 'rupture disk' system, we strongly recommend careful inspection of the drug solution before loading the drug. Pre-sterilising the package and providing sterile ampoules have also been recommended to prevent infection. In addition, prudent measures should be taken to make spinal and epidural drugs available in shatterproof and easily snappable ampoules. The manufacturers should also ensure that the paint used in 'rupture disk' ampoule does not get fragmented while snapping open the ampoule. Use of filters in needles and use of smaller gauge needles have also been advocated as measures to reduce loading of glass micro particles in syringes.<sup>[1]</sup> Use of pre-filled syringes can be the way forward to prevent contamination of drug as well as occupational hazards.

To conclude, careful inspection for visible ampoule impurities and ensuring strict asepsis can prevent iatrogenic complications during spinal anaesthesia.

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#### Conflicts of interest

There are no conflicts of interest.

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