

Tasleem's Water Jet sign - Revisited

Tasleem Arif

Department of Dermatology, Dar As Sihha Medical Complex, Dammam, Saudi Arabia

Corresponding author: Tasleem Arif, MD, E-mail: dr_tasleem_arif@yahoo.com

Sir,

Warts (verrucae) are benign proliferations arising from skin and mucosae caused by the human papillomavirus (HPV) [1]. Both keratinized (skin) and non-keratinized (mucosa) stratified squamous epithelium can get infected with HPVs and cause disease. Based on site of infection, warts can be broadly divided into cutaneous warts, genital warts, oral warts and laryngeal warts. Warts are spread either by direct or indirect contact [2,3]. There are many types of cutaneous warts like common warts, plantar warts, plane warts, periungual warts, filiform and digitate warts, pigmented warts, etc.

During the management of warts, while injecting local anesthetic around the site of wart, it was observed that the local anesthetic comes out through the surface of the wart like a jet of water what has been termed as "*Tasleem's water Jet sign*". At several occasions this jet of local anesthetic directly aims the face of treating dermatologist including the eyes [4].

After publication of this sign, couple of authors had questioned the individuality of this sign. According to them, this sign already existed by the name of "*Fountain sign*" seen in lichen planus hypertrophicus (LPH). The primary objective of writing this manuscript is to differentiate '*Tasleem's water jet sign*' from '*Fountain sign*' and to establish the individuality of the former. Additionally, in this article, pathophysiology of '*Tasleem's water jet sign*' has been re-visited which further helps in differentiating it from '*Fountain sign*'.

In LPH, there are hypertrophic verrucous plaques usually present over the anterior aspect of lower legs. The openings of hair follicles of these plaques are usually patulous. Since, these hypertrophic

plaques are quite resistant to topical treatment options, intralesional injection of corticosteroids has been recommended for them. During injection of intralesional corticosteroids, the liquid medicine comes out through the patulous follicular openings in the form of jet mimicking a fountain, hence referred to as '*fountain sign*'. Histopathology of LPH shows hydropic degeneration of the hair follicular wall as well as basal cell degeneration. Due to the hair follicular wall degeneration, the injected corticosteroid passes through the pilosebaceous canal easily and is ejected out forcefully through the patulous follicular openings which explains the genesis of this sign [5].

However, the pathophysiology of "*Tasleem's water jet sign*" is unlike. To understand its genesis, a thorough concept of histopathology of the wart is essential. Common and palmoplantar warts are characterized by hyperplasia of all the layers of the epidermis. There is marked hyperkeratosis with areas of parakeratosis especially above the papillomatous projections. Granular as well as spinous layers are conspicuously thickened. Elongated and flattened rete ridges are bent inwards towards the center of the wart forming a cup-shaped invagination below the papillomatosis. Papillomatosis is present in most of the warts but is not seen in plane warts. One of the characteristic histopathological features of viral warts is the presence of koilocytosis of upper layers of skin. Due to the infection by HPV, squamous epithelial cell undergoes a number of structural changes transferring it to a koilocyte. Such structural changes include expansion of nucleus (enlargement of nucleus to 2-3 times normal size), irregularity in the contour of nuclear membrane, hyperchromasia (darker staining pattern of the nucleus) and a clear area surrounding the nucleus, called as perinuclear cytoplasmic vacuolization or perinuclear halo. These changes are the result of cytopathic

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effects of HPV. Keratinocyte fragility can be reflective of cytoplasmic vacuolization seen in warts. In case of deep palmoplantar warts, the cytopathic effects are more obvious and may be visible in the lower stratum spinosum [2,6,7].

The histopathology of wart conceptualizes it as a potential anatomic chamber which is sealed by lateral walls and floor but with a potential weaker roof. The dense hyperkeratosis of the wart (roof), tough connective tissue of the palms and soles (the base/floor) and the elongated rete ridges which are bent inwards towards the center of the wart (lateral walls) comprise the boundaries of this imaginary chamber. In this chamber, there are columns of papillomatosis separated each other by potential spaces (channels) and some potential weak spaces created by cell degeneration (koilocytosis) due to the cytopathic effects of virus.

When the local anesthetic solution is injected near the base of the wart, the incoming anesthetic solution doesn't find sufficient space in tissues like palms, soles, etc where the tissue is tough and less yielding. The dense hyperkeratosis of the wart, non-yielding connective tissue of the palms and soles and the elongated rete ridges which are bent inwards towards the center of the wart do not allow the anesthetic solution to escape through the bottom and lateral walls of the wart. This creates a high pressure chamber holding anesthetic solution under pressure. Once, more anesthetic solution is injected, the pressure in this potential histological chamber further increases and the solution which is neither finding any way to escape from the chamber through sides or bottom nor able to accommodate due to unyielding nature of boundaries of the chamber, ejects out through the narrow spaces (channels) between the columns of dense papillomatosis and the potential weak spaces created by the cell degeneration process because of viral cytopathic effects, in the form of a jet known as 'Tasleem's water jet sign'.

Thus, it is evident, that 'fountain sign' which is seen in LPH, is because of hydropic degeneration of the hair follicular wall and is different from 'Tasleem's

water jet sign' seen in warts and whose genesis is more complicated.

The 'Tasleem's water jet sign' is mainly seen in palmoplantar warts where the skin is tough and unyielding. It is not observed in verruca plana and at other places where the skin is lax e.g., neck, scrotum, eye lids, axillae [4].

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