Therapeutic Plasma Exchange for Refractory Hemolysis After Brown Recluse Spider (Loxosceles reclusa) Envenomation

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The brown recluse spider (Loxosceles reclusa) is a small brown to grey spider that lives in the SE USA. Bites are usually self limited but can cause necrotic arachnidism as well as the more severe systemic loxoscelism.

Treatment for brown recluse spider (BRS) envenomation is usually supportive with local wound care although hemolysis can result from systemic toxicity. This may result in hemolysis requiring PRBC transfusion.

Therapeutic plasma exchange (TPE) is a process where plasma is separated from the cellular components of blood and then replaced w/ crystalloid or donor plasma. TPE has been used in snake envenomations but not for systemic loxoscelism.

The Case

A 17 YO F presents w/ hypotension and appears to be in septic shock from knee cellulitis. However, an ID consultant recognized a wound on the pt’s knee to look like a BRS envenomation. Antibiotics are held and the pt continues to deteriorate w/ worsening hemolysis despite receiving high doses of corticosteroids. Six days into the case TPE is tried and the patient gets better and is sent home. Long term follow up reveals that the pt developed a necrotic wound requiring surgical debridement and a complex wound closure 2 months later.

The patient is presumed to have systemic toxicity due to BRS envenomation or loxoscelism. Even though the spider was not identified, the course w/ the hemolysis and the necrotic wound strongly point to that diagnosis. Facts about BRS venom: it contains hyalurodinase to help the venom spread through tissues and sphingomyelinase D which is a cytotoxic enzyme though to activate complement-dependent hemolysis.

Therapeutic plasma exchange takes to liquid part of blood out of whole blood and replaces it w/ donor plasma or crystalloid. It is thought that the BRS venom may also be removed by the TPE or it may have removed complement components where had been activated by sphingomyelinase D as well as venom-specific IgG.

This patient did well after TPE when steroids had failed to control the hemolysis. Physicians should keep this therapeutic maneuver in the back of their mind for similar cases.