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**Title:** Spurious thrombocytosis in the setting of hemolytic anemia and microcytosis secondary to extensive burn injury.

**Running title:** Spurious thrombocytosis in extensive burns.

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**itle:** Spurious thrombocytosis in the setting of hemolytic anemia and microcytosis secondary to extensive burn injury.

**Brief title:** [Spurious thrombocytosis in extensive burns](#)

A 57-year-old gentleman was brought to our emergency department from a house fire. On physical examination, he was non-responsive, hypotensive, tachycardic with full thickness skin burns covering entirety of the body except lower back (>98% of his body surface area). He was intubated and aggressively resuscitated with IV fluids and multiple pressors for circulatory support.

Complete blood count (CBC) showed normal hemoglobin (14.5 g/dL) with leukocytosis ( $23.6 \times 10^9/L$ ) and thrombocytosis ( $979 \times 10^9/L$ ). Repeat CBCs also showed thrombocytosis (815 and  $1121 \times 10^9/L$ ). Microscopic examination of the peripheral blood smear showed widespread red blood cell (RBC) fragmentation, budding, spherocytes and microspherocytes (figure). Manual platelet count estimates on the peripheral blood smear demonstrated a count of  $173 \times 10^9/L$ . The patient remained in intractable hypotension and eventually went into cardiac arrest.

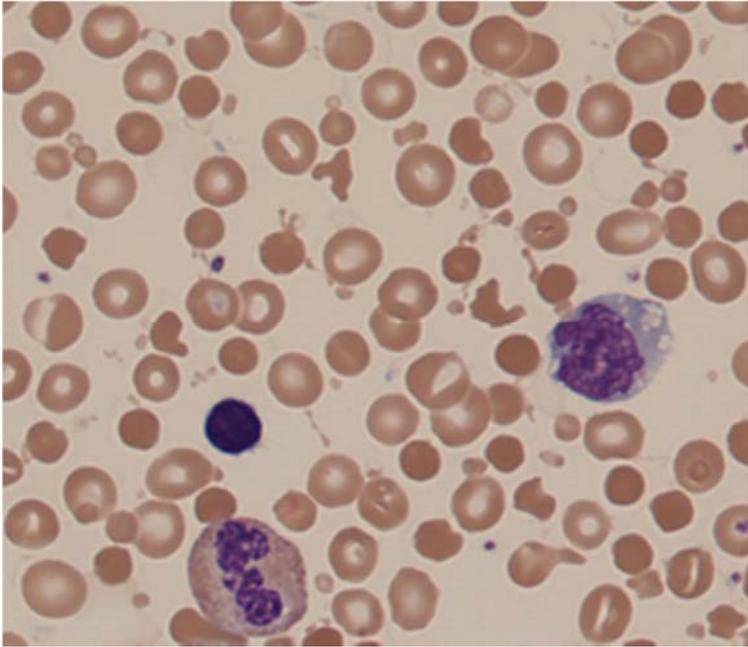
The aforementioned findings are seen in patients with severe burns due to direct thermal injury of RBCs circulating through skin. Exposure to extreme heat leads to denaturation of RBC membrane proteins that results in hemolysis, RBC fragmentation and vesiculation [1]. The loss of cell membrane causes the RBCs to lose their biconcavity and assume the shape of spherocytes and microspherocytes [1]. These RBC fragments and microspherocytes persist in the peripheral circulation for several days until completely removed from circulation by the reticuloendothelial system in the spleen. They are counted as platelets by aperture-based automated analyzers due to their size, leading to falsely elevated platelet counts in acute burns [1,2]. Although reactive thrombocytosis can be seen in acute injury as recently reported by Sapanara *et al* [2]. in a similar burn case of a 48 year old woman, such instances should always prompt a microscopic examination of the peripheralsmear to confirm if in fact the platelet count is elevated. A manual count of platelets on peripheral smear from that patient (like in our case) revealed a normal platelet count. Such examples emphasize the importance of correlating the peripheral smear with automated CBC results.

#### **Acknowledgements:**

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