Volumetric overload shocks in the patho-etiology of the transurethral resection prostatectomy syndrome and acute dilution hyponatraemia

Salma A. Ghanem[1], Nisha Pindoria[2], Khalid A. Ghanem[3] and Ahmed N. Ghanem[4]

[1] *Barts & The Royal London NHS Trust Royal London Hospital, Whitechapel road ,London*
North Middlesex University Hospital, London
Royal Sussex County Hospital, BN2 5BE. UK.
Mansoura University, No1 President Mubarak Street, Mansoura 35511, Egypt

Abstract

Hypothesis: The transurethral prostatectomy syndrome (TURS) is defined as severe vascular hypotension reaction that complicates endoscopic surgery as a result of massive irrigating fluid absorption causing severe acute dilution hyponatraemia (HN) of <120 mmol/l. The vascular shock is usually mistaken for one of the recognized shocks and Volumetric Overload Shock type 1 (VOS1) is overlooked**.**

Objective: To report VOS and its successful treatment of hyper-tonic sodium therapy that is life saving. To report that Starling's law is wrong and the correct replacement is the hydrodynamic of the porous orifice (G) tube.

Methods: We conducted the following studies:

1. Prospective study on 100 consecutive TURP patients among whom 10 developed the TURP syndrome with acute dilution hyponatraemia (HN) and vascular shock.
2. A case series of 23 TURP syndrome cases.
3. A physics study on the hydrodynamic of the G tube.

Results: The TURP syndrome is defined as severe vascular hypotension reaction that complicates endoscopic surgery as a result of massive irrigating fluid absorption causing severe acute dilution hyponatraemia (HN) of <120 mmol/l. The vascular shock is usually mistaken for one of the recognized shocks and Volumetric Overload Shock type 1 (VOS1) is overlooked making Volumetric Overload Shock Type 2 (VOS2) unrecognizable. In adults VOS1 is induced by the infusion of 3.5-5 litres of sodium-free fluids and is known as TURP syndrome or HN shock. VOS2 is induced by 12-14 litres of sodium-based fluids and is known as the adult respiratory distress syndrome. The most effective treatment for VOS1 and VOS2 is hypertonic sodium therapy (HST) of 5%NaCl or 8.4% Sodium Bicarbonate. The literature on TURS is reviewed and the underlying patho-etiology is discussed. Starling's law proved wrong and the correct replacement is the hydrodynamic of the G tube.

Conclusion: Volumetric overload causes shock of two types, VOS1 and VOS2. VOS 1 is characterized with acute dilution HN and is known as the TURP syndrome. Mistaking VOS1 for a recognized shock and treating it with vascular expansion is lethal while HST is life-saving. Starling's law which dictates the rules on fluid therapy proved wrong and the correct replacement is the hydrodynamic of the G tube.

Key Words

Hyponatraemia; shock; the transurethral prostatectomy syndrome; the adult respiratory distress syndrome, Starling's law, Capillary hydrodynamics

Key points

Question: Does TURP syndrome present with shock, how best it should be treated and what is its relevance to Starling's law?

Findings: The TURP syndrome presents with shock usually mistaken for recognized shocks and treated with volume expansion with lethal outcome. The effective treatment is hypertonic sodium therapy (HST). Starling's law which dictates faulty rules on fluid therapy proved wrong. Replacement was found by studying the hydrodynamics of the porous orifice (G) tube.

Meaning: The TURP syndrome presents with volumetric overload shock (VOS) best treated with HST, Starling's law is wrong and the correct replacement is the hydrodynamic of the G tube.

syndromes are discussed. The puzzles of TURP syndrome, Dilution HN and ARDS are resolved

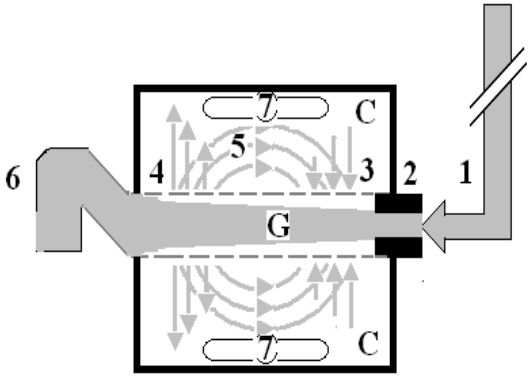

Figure: shows diagram of the porous orifice (G) tube enclosed in chamber (C) based on several photographs demonstrating the magnetic field-like G-C circulation phenomenon. The proximal inflow (arterial) pressure (1) pushes fluid through the orifice (2) creating fluid jet in the lumen of the G tube. The fluid jet creates negative side pressure gradient causing suction maximal over the proximal half of the G tube near the inlet (3) that sucks fluid into lumen. The side pressure gradient turns positive pushing fluid out of lumen over the distal half maximally near the outlet (4). Thus the fluid around G tube inside C moves in magnetic field-like fluid circulation (5) taking an opposite direction to lumen flow of G. tube. The inflow (arterial) pressure (1) and orifice (2) induce the negative side pressure energy creating the dynamic G-C circulation phenomenon that is rapid, autonomous and efficient in moving fluid out from the G tube lumen at (4), irrigating C at (5), then sucking it back again at (3), maintaining net negative energy pressure (7) inside C. The distal outflow (venous) pressure (6) enhances outflow at (4) and its elevation may turn the negative energy pressure (7) inside C into positive, increasing volume and pressure inside C chamber

Biography:

Dr Ghanem was educated in Egypt and qualified in 1974, Mansoura University, Egypt. He gained postgraduate experience in UK where he was promoted in posts up to the consultant level. He practiced as consultant Urologist in UK, Saudi Arabia and Egypt. During his career he reported over 100 articles. He discovered two new types of vascular shocks, proved that one physiological law is wrong and provided an alternative. He resolved the puzzles of 3 clinical syndromes; TURP syndrome, LPHS and ARDS. He is now on an editorial board member and reviewer of many journals, and Editor-in-Chief to Surgical Medicine Open Access Journal (SMOAJ) while he is happily retired in Egypt dedicated to scientific medical reading and writing that helps the practicing physicians to practice precision medicine as well as correctly directing the future research

Speaker Publications:

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