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Electron Microscopical Analysis of Arterial Line Filters During Cardiopulmonary Bypass

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Abstract : Introduction: The clinical value of arterial line filters is still a controversial issue. Proponents of arterial line filtration argue that filters remove particulate matter and undissolved gas from circulation, while opponents argue the absence of conclusive clinical data. We conducted scanning electron microscope (SEM) studies of arterial line filters used clinically in the CPB circuits during adult cardiac surgery and analyzed the types and characteristics of materials entrapped in the arterial line filters. Material and Methods: Twelve arterial line filters were obtained during routine hypothermic cardiopulmonary bypass in 12 adult cardiac patients. The arterial line filter was a screen type with a pore size of 40 □ (Baxter Health care corporation Bentley division, Irvine, CA, U.S.A.). After opening the housing, the woven polyester strands were examined with SEM. Results and Conclusion: All segments examined(120 segments, each 2.5 X 2.5 cm in size) contained no embolic particles larger in their cross-sectional area than the pore size of the filter(40 □). The origins of embolic particulates were mostly from environmental foreign bodies. This may suggest a possible need for more aggressive filtration of smaller particulates than is generally carried out at the present time.

Keywords : arterial line filter, tubing wear, scanning electron microscopy, SEM
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