Surgifoam

Surgifoam powder (absorbable porcine gelatine, also: Spongostan powder) is a hemostat and forms a paste that can be spread or shaped to conform to irregular surfaces to stop bleeding fast. In contrast to bone wax, Surgifoam powder is easily moulded on the irregular surfaces of chipped bone. Bleeding will stop almost immediately.

Its technical properties make it unlikely to cause mass effects. However, residual Surgifoam powder should be removed by topical suction or irrigation ¹⁾.

The tissue reaction to SURGIFOAM sponge was characterized by transient granulomatous inflammation that was slightly less intense than that observed for GELFOAM sponge which correlated to slightly longer absorption. In contrast, the tissue reaction to Avitene hemostat was characterized by moderate to marked granulomatous inflammation with an acute inflammatory component indicating a greater degree of tissue irritancy. Sequelae of this reaction were still observed at 92 days post-implantation. The tissue reaction in humans to SURGIFOAM sponge used as a hemostatic agent for neurologic surgical procedures is expected to be comparable to that observed with GELFOAM sponge, resulting in no significant adverse reactions for patients ².

Indications

Hemostasis management during completely endoscopic removal of a highly vascular intraparenchymal brain tumor. $^{3)}$.

A mix of Surgifoam and mitoxantrone could be safely applied intraoperatively into the postglioblastoma multiforme resection cavity without any observable side effects. This technique may benefit both the surgeon and the patient by taking advantage of the drug's hemostatic and cytostatic properties ⁴⁾.

Complications

A 65-year-old woman underwent an uneventful C3-4 anterior cervical discectomy and fusion for a large, symptomatic disc herniation. On postoperative Day 1 the patient suffered a sudden, acute respiratory compromise. Emergency fiberoptic intubation revealed significant anterior neck swelling with concern for physical obstruction of the airway. Computed tomography of the neck did not demonstrate an expanding hematoma. The patient was managed with surgical wound exploration and washout. Examination of the anterior neck after incision of the prior surgical site revealed a large volume of Surgifoam under high pressure, which was greater than the amount used during the initial surgery. Thorough washout of the surgical site did not reveal any swelling of the prevertebral soft tissues or hematoma, and the Hemovac drain did not appear to be occluded. The patient was extubated on the 2nd postoperative day and is symptom free 12 months after surgery. To the authors' knowledge, this report represents the first reported complication of acute respiratory failure from Surgifoam overexpansion after anterior cervical surgery⁵⁾.

the first reported complication of intraoperative death associated with Surgifoam (Ethicon, Somerville, NJ) thromboembolization to the heart and lung microcirculation following its application into a bleeding bone defect.Methods. A 56-year-old male was undergoing revision fusion surgery for pseudoarthrosis following multilevel thoracolumbosacral fusion with pelvic fixation for degenerative

scoliosis. Intraoperatively, upon removal of the right iliac screw, heavy venous bleeding was encountered which was stopped following application of 10mL of Surgifoam into the screw defect. Approximately 5 minutes later the patient's end tidal CO2 dropped and his pulse was lost. Epinephrine was administered and the patient was immediately turned to supine position and cardiopulmonary resuscitation (CPR) initiated. CPR was performed unsuccessfully for 30 minutes at the end of which the patient was pronounced dead.Results. Autopsy findings revealed angulated particles of hemostatic agent with entrapped red blood cells partially to completely occluding small to medium sized vessels of the heart and lungs. The cause of death was pulmonary and cardiac embolization of foreign material from the surgical screw defect to the vessels of the heart and lungs significantly compromising respiration and blood flow causing sudden death.Conclusion. Although Surgifoam is an excellent hemostatic agent for use in spinal surgery, its must be used with extreme caution in the setting of heavily bleeding bone defects following pedicle cannulation or removal of instrumentation. In cases when brisk venous bleeding is encountered, signifying potential compromise of an emissary vein, use of other hemostatic agents such as bone wax may be a safer option ⁶⁾.

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