



Justin A. Doble and Eric M. Pauli

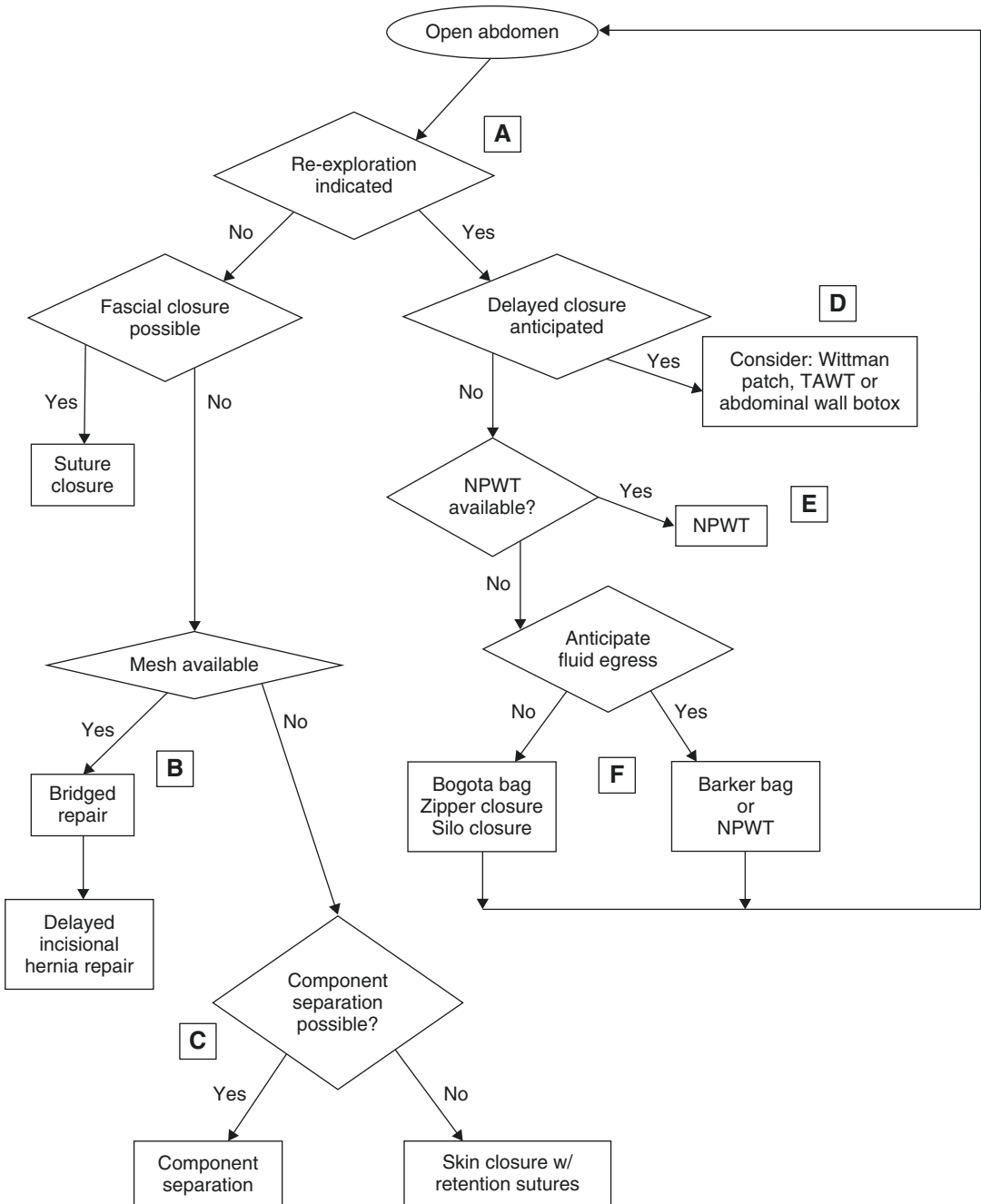
## Algorithmic Approach

- A. All abdominal closure therapies should primarily focus on prevention of gastrointestinal fistula formation with a secondary endpoint of definitive abdominal closure.
- B. Options for a bridged repair include Vicryl and biologic mesh. Vicryl mesh will be reabsorbed quickly (6 weeks) leading to an early, large hernia formation, and in the event of a deep surgical site infection, the exposed mesh will permit large hydraulic shift of fluid from the bowel leading to desiccation and possible fistula formation. Biologic mesh will fail over a longer period of time (80% at 2 years [1]) but carries an increase in cost and risk of biologic mesh complication (seroma/wound infection). However, in the event of a deep surgical site infection, the mesh will not permit underlying bowel desiccation and permits negative-pressure wound therapy (NPWT) directly on the mesh.
- C. Performing a component separation in an acute or emergent procedure should be done with extreme caution as it carries a higher set of risks than in the elective setting. Moreover, it eliminates viable options for definitive repair of the hernia at a later date and generally makes the reoperation much more complex. The division of anterior and posterior components should not be performed during a single operation, and operations that intentionally divide the linea semilunaris should be avoided altogether.
- D. The success rate for primary fascial closure decreases by approximately 1.1% for each 24-h delay after initial laparotomy [2]. Early anticipation of delayed closure and the use of a Wittman patch and transabdominal wall traction (TAWT) systems have been shown to increase abdominal closure rates. These devices facilitate closure by facilitating sequential isometric contraction of the abdominal wall via Velcro sheets sewn to the fascia (Wittman patch) or with transfascial sutures secured over a plastic skin bolster (TAWT). Additionally, chemical component separation with botulinum toxin has been described to increase the probability of primary fascial closure [3].
- E. Negative-pressure wound therapy systems are available as a preassembled commercial product or can be created out of standard operative supplies. NPWT devices can be safely used for temporary abdominal closures and may improve success rates of primary fascial closure [4].
- F. There are several options for temporary abdominal closure when a large intraabdominal fluid (blood or ascites) volume is not

J. A. Doble · E. M. Pauli (✉)  
Department of Surgery, Penn State Milton S. Hershey  
Medical Center, Hershey, PA, USA  
e-mail: [epauli@pennstatehealth.psu.edu](mailto:epauli@pennstatehealth.psu.edu)

expected. The Bogota bag technique is performed by suturing a sterile, clear plastic sheet, usually from an X-ray cassette sheet or IV bag to the fascia. A silo closure wraps the externalized bowel in plastic secured to the fascial edges. The zipper closure method

attaches both fascial edges to a slide fastening device, thus allowing for quick temporary exposure/closure of the abdomen. The barker bag technique is an intraoperatively constructed negative-pressure wound therapy system.



Algorithm 195.1

## References

1. Blatnik J, Jin J, Rosen M. Abdominal hernia repair with bridging acellular dermal matrix – an expensive hernia sac. *Am J Surg.* 2008;196(1):47–50.
2. Pommerening MJ, DuBose JJ, Zielinski MD, et al. Time to first take-back operation predicts successful primary fascial closure in patients undergoing damage control laparotomy. *Surgery.* 2014;156(2):431–8.
3. Zielinski MD, Goussous N, Schiller HJ, Jenkins D. Chemical components separation with botulinum toxin a: a novel technique to improve primary fascial closure rates of the open abdomen. *Hernia.* 2013;17(1):101–7.
4. Cirocchi R, Birindelli A, Biffi WL, et al. What is the effectiveness of the negative pressure wound therapy (NPWT) in patients treated with open abdomen technique? A systematic review and meta-analysis. *J Trauma Acute Care Surg.* 2016;81(3):575–84.