



PERIOPERATIVE MANAGEMENT OF A PATIENT WITH COLD AGGLUTININ DISEASE PRESENTING FOR TOTAL KNEE ARTHROPLASTY UNDER SPINAL ANESTHESIA

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INTRODUCTION

• Idiopathic cold agglutinin disease (CAD) is a form of autoimmune hemolytic anemia (AIHA) characterized by autoantibody mediated red blood cell (RBC) agglutination and hemolytic anemia at cold temperatures¹.

• Clinical manifestations include cold-induced circulatory symptoms related to RBC agglutination in cooler parts of the body, including livedo reticularis, Raynaud disease, acrocyanosis and in rare cases cutaneous necrosis¹. Therefore, this condition requires unique perioperative considerations due to the risk of hypothermia with anesthesia.

• Hypothermia is seen in both general and regional anesthesia due to impairments in thermoregulatory control, including redistribution of heat from the core to periphery, markedly reduced temperature thresholds for vasoconstriction, and shivering³.

• While there are scant reports describing successful perioperative management of patients with CAD under general anesthesia, a lack of literature exists regarding perioperative management of these patients undergoing neuraxial anesthesia.

• Due to the overall lack of literature on this topic despite the similarities in thermoregulatory inhibition between general and regional anesthesia, there is no clear guidance on selecting between general and regional anesthesia in this patient population.

CASE PRESENTATION

Preoperative Presentation

• An 83-year-old female with a history of idiopathic cold agglutinin disease presented for an elective robotic assisted right total knee arthroplasty (TKA).

• In the past, she had episodic anemia triggered by sepsis resulting in hospitalizations requiring treatment with IVIG, glucocorticoids, and rituximab.

• For 1 year leading up to TKA, her laboratory studies were stable with no signs of acute exacerbation of her condition.

• Surgery was performed in a community hospital with direct access to a tertiary care center.

PREOPERATIVE DATA

Analyte	Patient Result	Reference Range
Hemoglobin	8.8 g/dL	12-15 g/dL
Reticulocytes	6.1%	0.5-1.5%
Absolute Reticulocyte count	0.15 mil/cu mm	0.03-0.08 mil/cu mm

MANAGEMENT AND OUTCOME

Intraoperative Management

• The patient received a spinal anesthetic with 3.2 mL of 2% mepivacaine and a post-operative adductor canal block with 15 mL of 0.5% bupivacaine with epinephrine. A propofol infusion was used for intraoperative sedation.

• Tight temperature control with axillary skin temperature monitoring was employed. Warming strategies included forced air warmers, warm blankets, warmed IV fluids, and warming of the local anesthetics prior to injection.

• Intraoperative temperature range was approximately 35.9-36.6° C.

Postoperative Course and Outcome

• No signs or symptoms of acute hemolysis were observed and the patient discharged on POD 1.

• Repeat laboratory studies 1 month later were within her established baseline.

POSTOPERATIVE DATA

Analyte	Patient Result	Reference Range
Hemoglobin	8.2 g/dL	12-15 g/dL
Reticulocytes	7.8%	0.5-1.5%
Absolute Reticulocyte count	0.17 mil/cu mm	0.03-0.08 mil/cu mm

PERIOPERATIVE CONSIDERATIONS

FIGURE 1

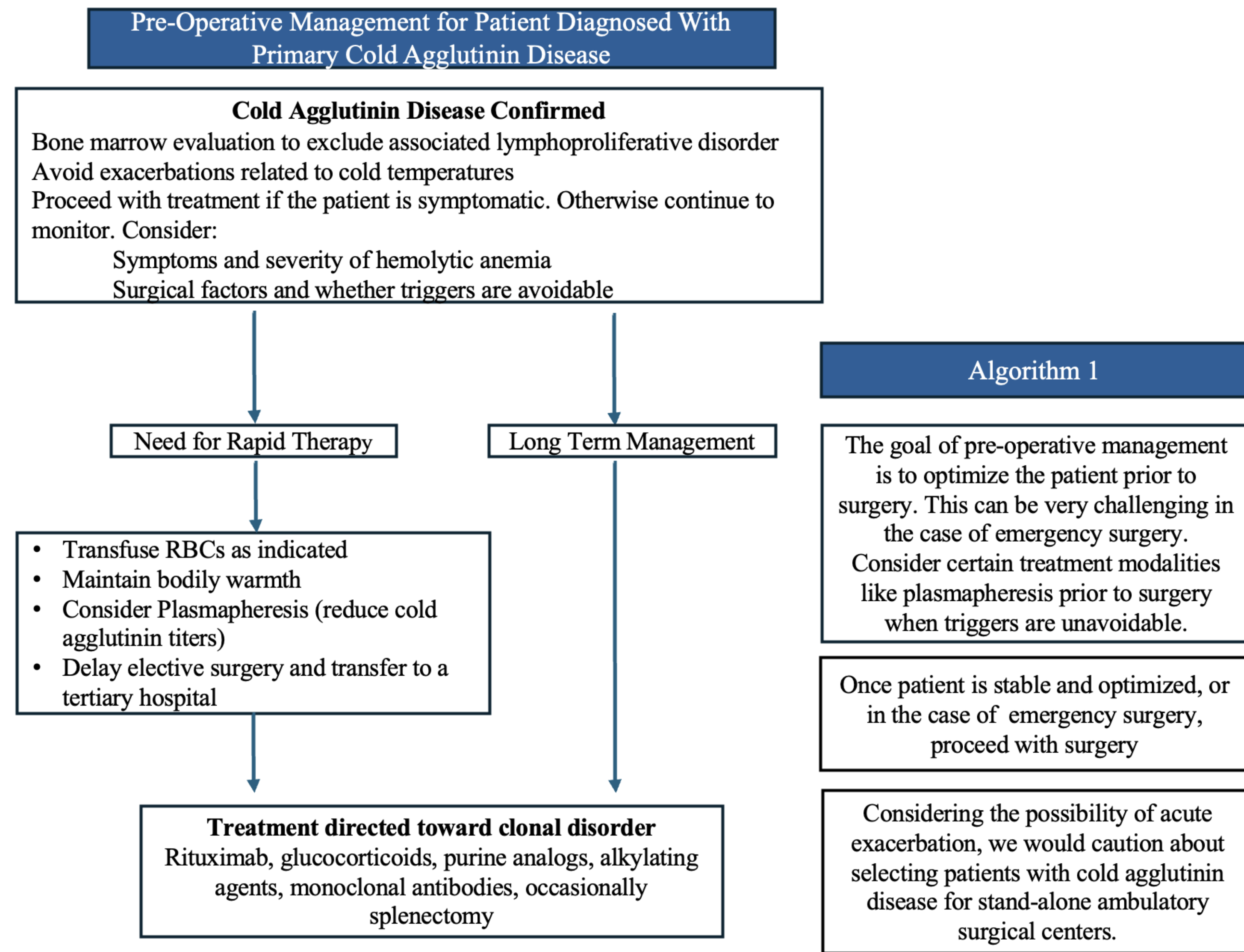
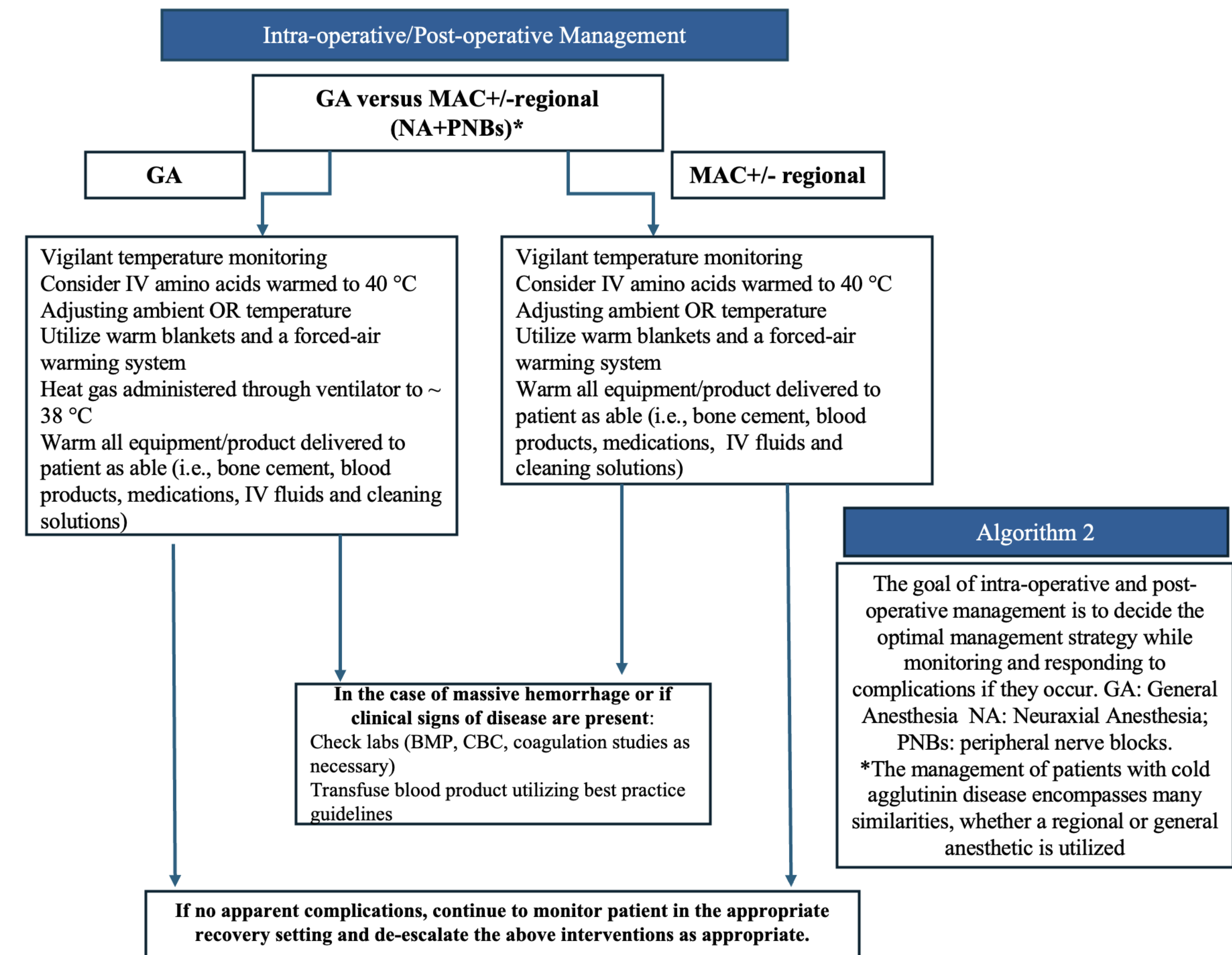


FIGURE 2



DISCUSSION

• Regardless of anesthetic selection, the mainstay of management includes preoperative optimization (Figure 1) and perioperative maintenance of normothermia with aggressive warming strategies (Figure 2).

• Core body temperature monitoring (pulmonary artery, esophageal, nasopharynx) is not practical under neuraxial anesthesia, but axillary temperature is a reasonable alternative when placed correctly³.

• Assessment of signs or symptoms of an acute CAD exacerbation is critical before proceeding with elective surgery.

• Additional pre-operative therapies such as plasma exchange, disease modifying medications, or splenectomy may be needed in patients with evidence of acute hemolysis (Figure 1)^{1,4,5}. In these instances, elective surgery should be delayed, and the patient should be transferred to a tertiary care facility.

• Caution must be taken with selecting patients with CAD for surgery in an ambulatory setting without access to tertiary care facilities.

• In summary, both regional and general anesthesia may be reasonable anesthetic options for patients with CAD with vigilant temperature monitoring and aggressive warming strategies.

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