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Opinion

To Take Decisions in Postoperative Mediastinitis. Challenges and Future Considerations

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To take decisions is always a challenge, not only for decision makers, but for those involved in the decision made too. The implications are greater when the decision has to do with the health of people or can cause death. Modern medicine requires speed to decide, which raises the quality of medical care and for this purpose protocols and action guides are very useful. These are currently represented in algorithms, decision trees or decision maps for didactic purposes. For their elaboration must be taken into account the evolution of the conceptual paradigms of medicine from the palliative, followed by the curative, then the preventive and more recently the predictive paradigm, based on medical evidence, personalized and precision medicine [1-5].

Postoperative mediastinitis is the deep infection of the longitudinal median sternotomy, which is the most important surgical incision to performed cardiovascular surgery. If postoperative mediastinitis is suspected in a patient, decisions are always difficult. It is a complication with high morbidity and mortality that can reach up to 40%. Despite the advances in this type of surgery, incidences between 1 and 4% are still reported. We have the great challenge of reducing or eliminating its impact in the present [6-8].

Therefore, we recommend more comprehensive guides that should include the following aspects:

1. Prediction
2. Diagnostic help
3. Prevention
4. Control

For its conformation the consensus of experts is required, with the evidence of their professional experience and knowledge of the state of the art. It is also necessary to know the indexes that this complication exhibits in the study population and its epidemiological characteristics.

Prediction

It is necessary now a days, modern medicine requires it. Optimize spending resources based on the most risky ones. Its calculation is possible by mathematical models based on risk factors. To estimate the probability of postoperative mediastinitis, giving added value to the prediction must be used preoperative, intraoperative and immediate postoperative risk factors. Expert opinion and the use of artificial intelligence methods and neural networks improve the possibilities of mathematical models. Risk scores can be elaborated to make easy the prediction [9-14].

Diagnostic help

After the risk was estimated in each patient, it is necessary to reduce the time interval from suspect to surgical reintervention. To do this, professionals must be insightful to diagnose quickly, as the prognosis of this complication worsens if do not act immediately. So diagnostic patterns can be established and in addition with the predicted risk, constitute a score of diagnostic help. Statistical and mathematical methods can be used, by combining signs and symptoms, allow the diagnosis to be accelerated in a suspected patient. An important element is to take into account intraoperative conditions of the sternum that make it vulnerable to infection or dehiscence [8].

Prevention

The prevention of postoperative infection should be performed in 100% of the patients surgically operated. Obviously, those with the highest risk must be rigorously acted upon. Of great importance is to optimize the preoperative check. Preoperative preparation is essential, both psychological and physical, with an emphasis on respiratory physiotherapy. Shaving and conditioning of the patient's skin. Medication, dispositions regarding bathing and diet, trying to avoid prolonged fasting and achieving glycemic control. Antimicrobial prophylaxis is an ingredient that cannot be missed. In addition to all measures by anaesthetist aimed at a speedy recovery. Measures that guarantee a refined surgical technique with correct asepsis and antisepsis are included in the prevention, as well as the environment of the surgical unit and postoperative care room, with emphasis on climate, cleaning and disinfection, sterilization of instruments, equipment, furniture and vaporizing the unit [15-18].

Control

This is aimed to reducing the interval between suspect and reintervention, which is always necessary and should be done early. After the initial debridement there remains the challenge of deciding on closed or open methods to treat it. Aspiration methods with negative pressures have effectively reduced mortality and simplified treatment. Subsequent reconstructive procedures are very useful. But to make recommendations of any method it is essential to evaluate its effectiveness, which must be done by creating models that include indicators and cut-off points. Almost always with the consultation of experts [15-21].

Future Considerations

- Under the current conditions, the challenge is zero incidence of postoperative mediastinitis, which is possible.
- I believe that postoperative mediastinitis should be reclassified and reconceptualized, especially if we take into account the new paradigms of the surgical approach to the heart such as minimally invasive, robotic, single-port surgery or natural orifice approach, or percutaneous or hybrid route, with great potential future.
- Perform sternotomies in ideal conditions to prevent sepsis and sternal dehiscence.
- Implement accurate predictive models.
- Three-dimensional printing of sternal prostheses.
- Tissue engineering, bone tissue culture, cell matrices, stem cells.
- Freeze the umbilical cord as life insurance so as not to get sick or be able to cure with totipotential stem cells.

- Cloning of people in defiance of the true God or cloning of organs and placing them in banks for transplantation.
- Biobanks.
- Holographic surgery with mathematical- physical models to extrapolate the real human, artificial intelligence and neural networks.

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