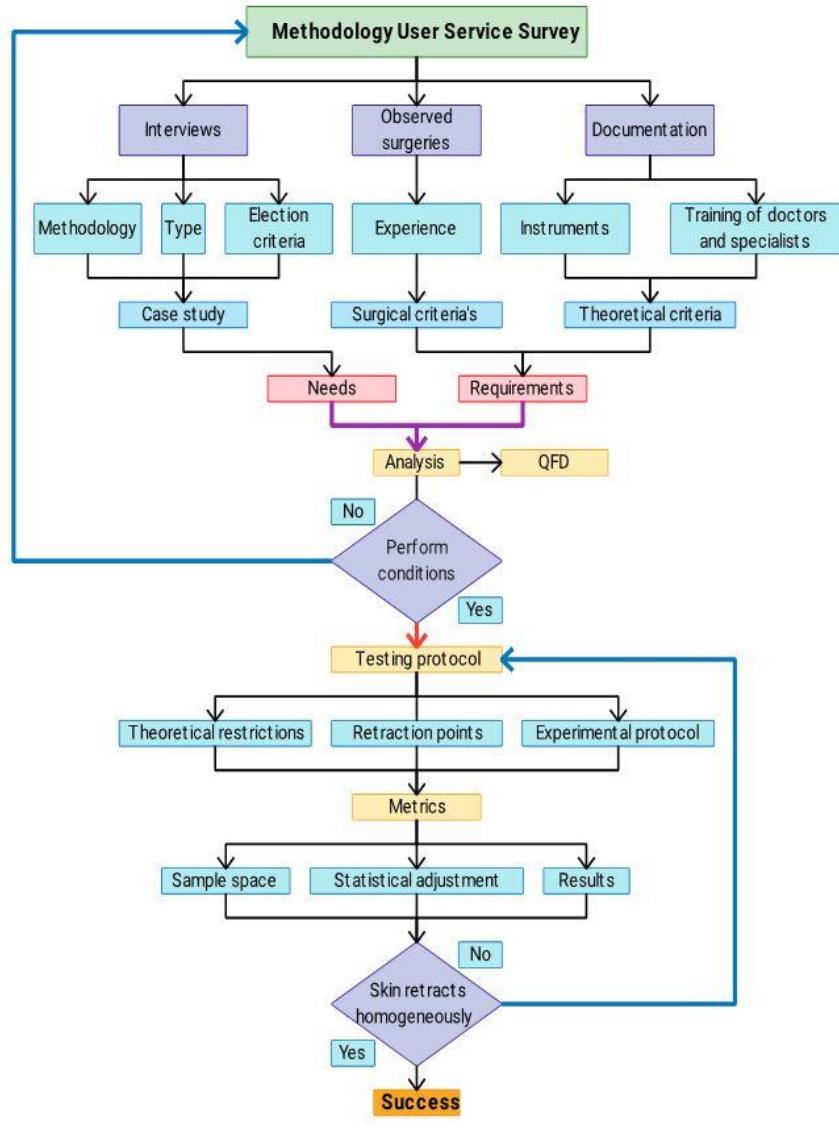


# Abstract

The experimental results of forces and efforts derived from the opening of incisions in the orbital cavity in a pig's head are presented in this article. The different areas of the incision openings are related to the needs at the incision procedure for a dacryocystorhinostomy. In terms of experimental procedure, an origin and a plane are defined to allow the location of the opening of the incision. The incisions are retracted along an axis of said origin. This procedure has been based on the mathematical model developed for this work, which consists of a procedure for determining the behavior of an incision when a force is applied to retract the skin. The experimental data obtained, suggests the existence of an almost linear relationship between the increment of resistance in relation to the time obtained for each opening, same of which is deemed to be consistent with the behavior of an elastic material.

**Keywords:** Incisions opening, Forces, parameters, ocular cavity

**Figure 1.** Methodology defined to design an RRS.



**Figure 1**

**Figure 2.** Given the user necessities the parameters founded on the surgeries observed and the documentation stages, it was possible to realize the following House of Quality

	1	2	3	4	5	6	7	8	1	2
limit opening	9	9	1	9	1	1	1	1	1	1
several opening points	3	3	1	3	1	1	1	1	1	1
opening at different depths	1	1	1	1	1	1	1	1	1	1
controlled opening system	1	1	1	1	1	1	1	1	1	1
silent system	9	3	1	9	1	1	1	1	1	1
easy to use	1	1	1	1	1	1	1	1	1	1
Without electricity	9	9	1	9	1	1	1	1	1	1
low cost materials	1	3	3	3	1	9	1	1	1	1
importance for the user (1 a 5)										
Opens to a required area	9	9	1	9	1	1	1	1	1	1
Safe	3	3	1	3	1	1	1	1	1	1
Not electrical	1	1	1	1	1	1	1	1	1	1
Not loud	1	1	1	1	1	1	1	1	1	1
Cheap	1	1	1	1	1	1	1	1	1	1
Able to open to different sizes	9	3	1	9	1	1	1	1	1	1
Adaptable to different depths	1	1	9	3	1	1	1	1	1	1
Do not block the work space	1	3	1	9	1	9	1	1	1	1
Opening the eye for a defined period of time	9	9	1	9	1	1	1	1	1	1
Easy to use	1	3	3	3	1	9	1	1	1	1
x										
Technical Evaluation										
Weighted importance										
Relative importance										
Importance rating										
	36	34	20	48	18	26	18	18	18	18
	↑	↓	↑	↑	↑	↑	↑	↑	↑	↑
	16.51	15.6	9.2	22.02	8.3	11.93	8.3	8.3	8.3	100
	3	4	5	1	6	2	6	6	6	218

1. Must have an opening system controlled by the specialist and limited by the pressure supported.
2. Must work with a system easy to handle by the specialist
3. Must limit the opening considering the pressure.
4. Must establish opening points considering the required work space and the user safety
5. Must consider different opening depths appropriate to the needs of the specialist
6. Must be a silent operating system
7. Must work without electricity
8. Must be built with low cost materials and systems

Figure 2

**Figure 3.** Outline of the theoretical restrictions.

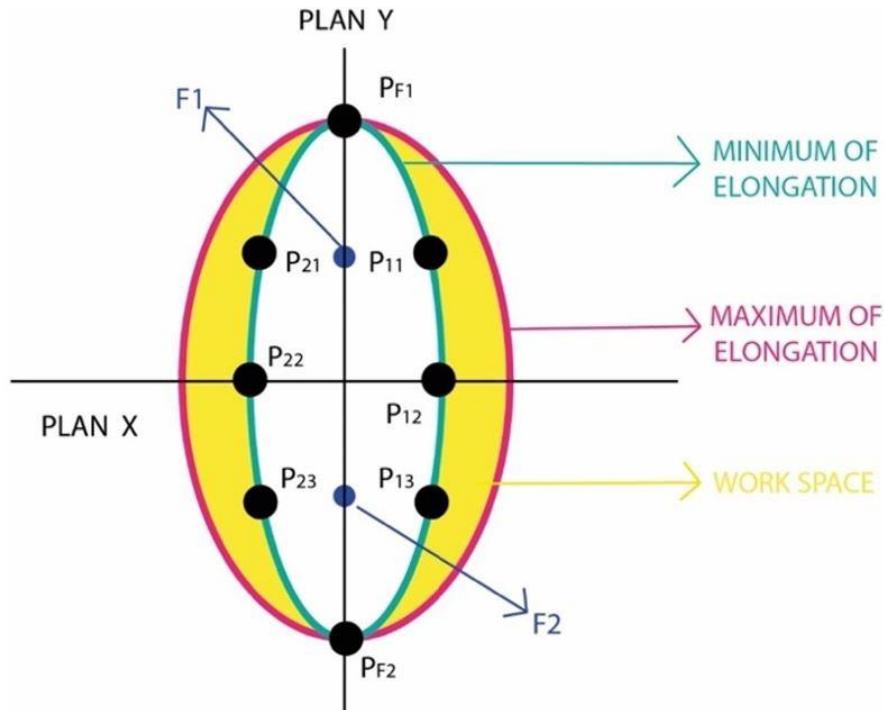
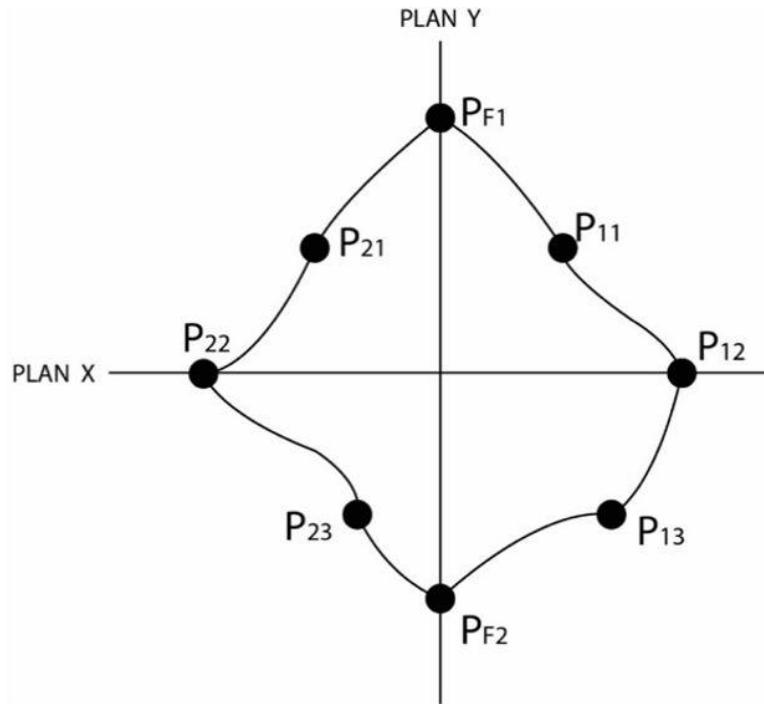


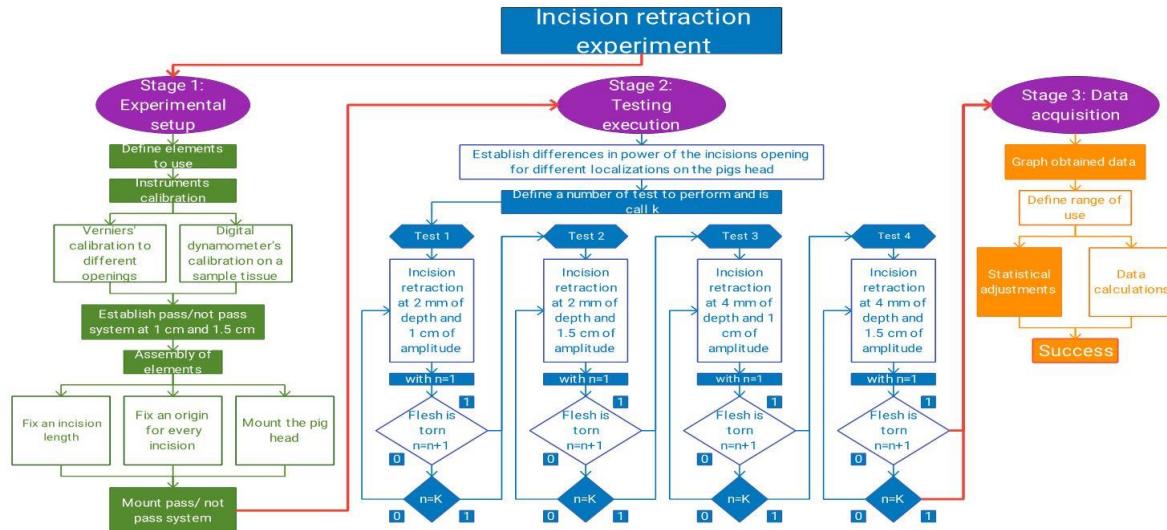
Figure 3

**Figure 4.** Outline of the theoretical restrictions.



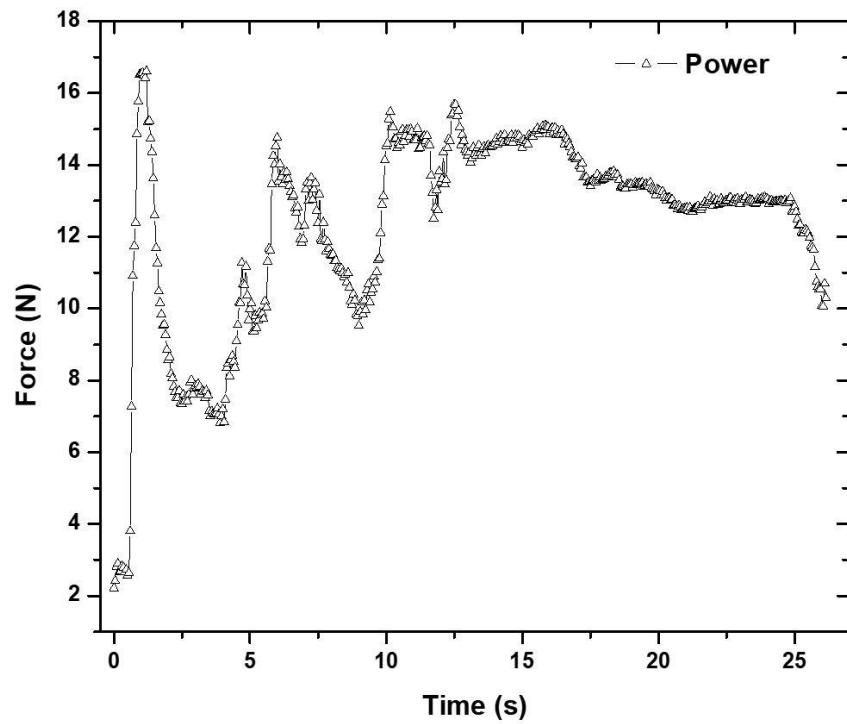
**Figure 4**

**Figure 5.** Experimental protocol.



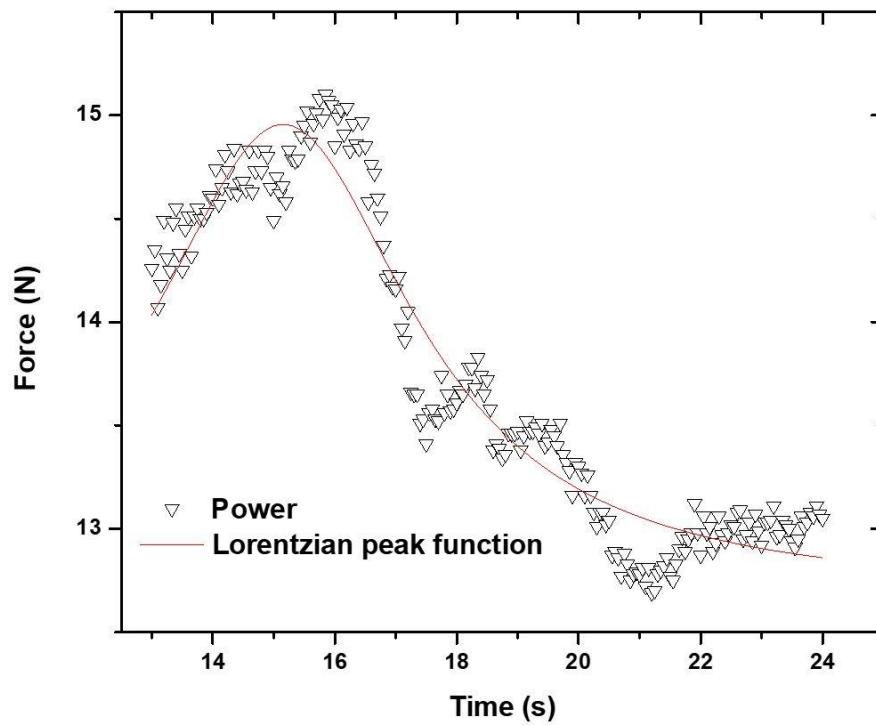
**Figure 5**

**Figure 6.** Forces measured during the entire process of opening the incision.



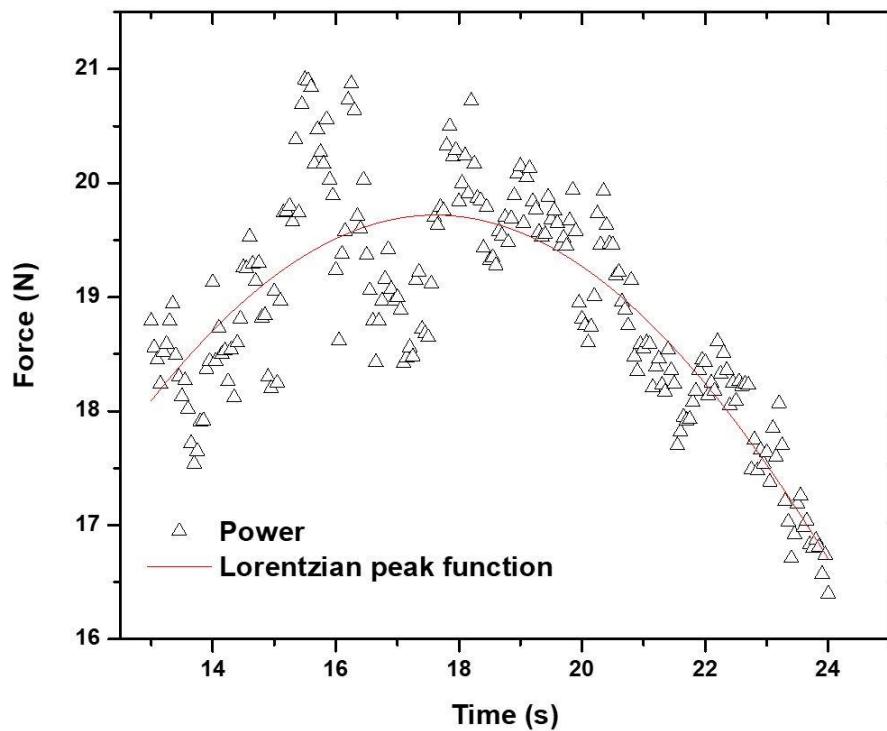
**Figure 6**

**Figure 7.** Lorentz adjustment for the experimental test.



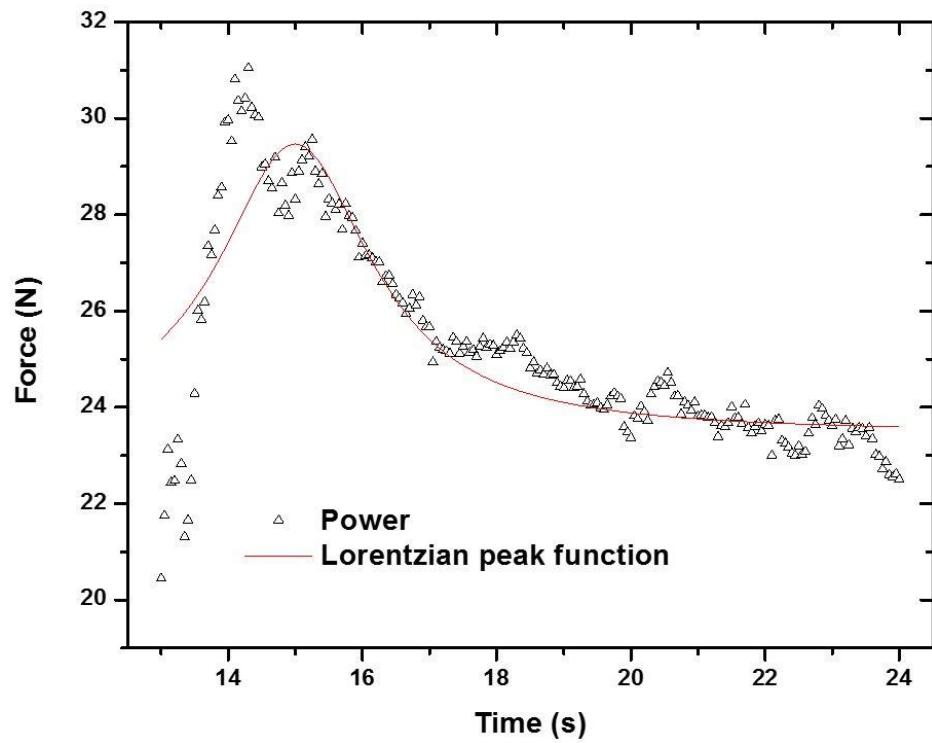
**Figure 7**

**Figure 8.** Lorentz adjustment for the experimental test.



**Figure 8**

**Figure 9.** Lorentz adjustment for the experimental test.



**Figure 9**

Figure 10. Lorentz adjustment for the experimental test for the average of all the forces.

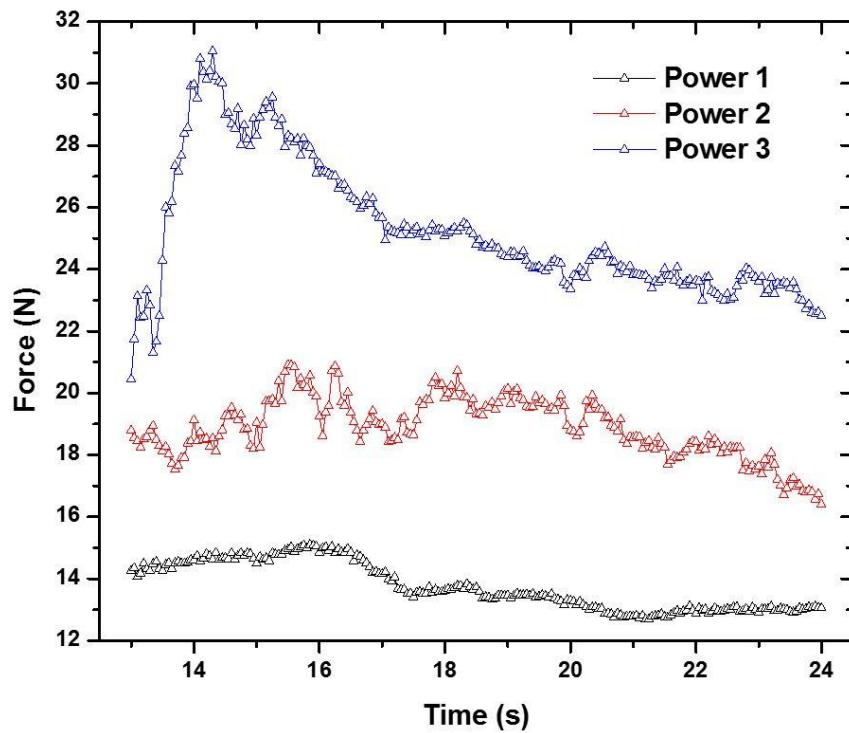


Figure 10

Figure 11. Graph of media behavior for the three powers measured.

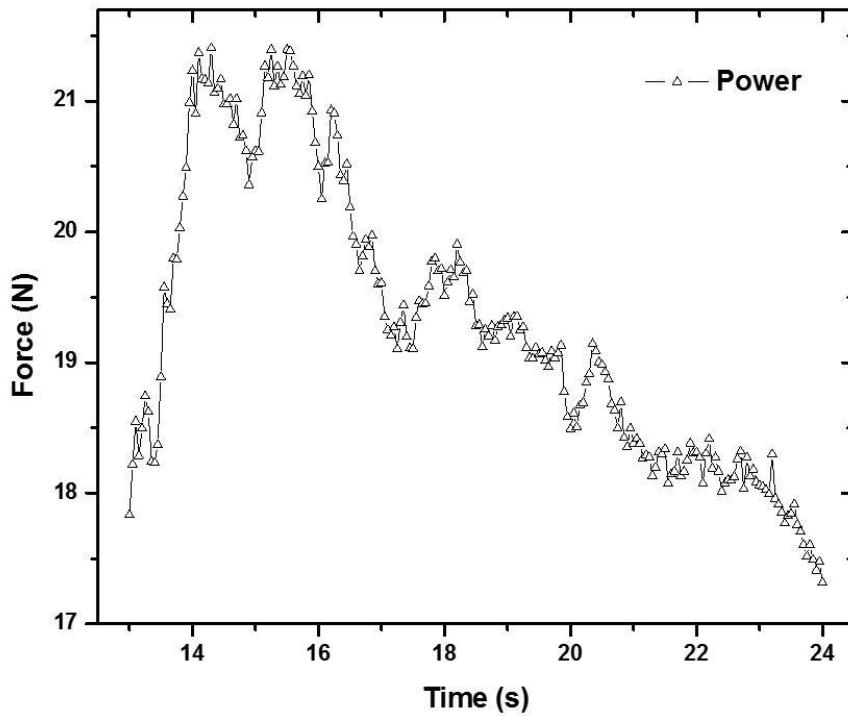


Figure 11