

CHANGING MESH MATERIAL WOULD CHANGE INFLAMMATORY RESPONSE? DIFFERENCES BETWEEN POLYPROPYLENE (GYNAMESH®) AND POLYVINYLIDENE FLUORIDE (DYNAMESH®) MESH IMPLANT IN RABBITS VAGINAL WALL.

Hypothesis / aims of study

Since meshes were introduced as one alternative in pelvic prolapse repair, we have been observed significant decrease in recurrence rate. However, increasing number of mesh complications has been described. Mesh can be made in several different conformations and using different materials. Nevertheless, it has not been well explored in experimental studies. In the present manuscript, we evaluated the inflammatory area generated after implantation of two macropore monofilament meshes in rabbit's vaginal wall.

Study design, materials and methods

We performed mesh implantation in the anterior vaginal wall of eight adult female rabbits. Group 1 - four rabbits implanted with monofilament macropore polypropylene mesh (Gynamesh®) and Group 2 - four rabbits implanted with monofilament macropore of polyvinylidene fluoride (Dynamesh®) in vaginal wall.

For the mesh implant rabbits were anesthetized with ketamine (20 mg/kg) and Xylazine (4 mg/kg) intramuscular (IM). After 16 weeks, rabbits were sacrificed, the vaginal wall was harvested, paraffin embedded and evaluated regard morphology and inflammatory response. To determine the inflammatory response it was measured the total area of inflammatory response (lymphocytes, neutrophils and fibrosis) around the mesh. To normalize we determined the mesh mass (area occupied by mesh). Thus, the inflammatory area = reactional area - mesh area.

Results

Both meshes generate similar cellular response with lymphocytes and neutrophils surrounding the mesh. Gynamesh® presented a significant greater area of inflammatory response when compared with Dynamesh® (TABLE 1 $p < 0,001$). Figure 1 shows the area surrounding inflammatory rabbit of Group 1

TABLE 1- Inflammatory area (μm) 16 weeks after vaginal implantation in groups 1 and 2.

	Dynamesh (Group1)	Gynamesh (Group2)
Rabbit1	270.228 μm	1.692.670 μm
Rabbit2	384.684 μm	925.892 μm
Rabbit3	671.870 μm	1.339.085 μm
Rabbit4	444.501 μm	803.469 μm
Total (inflammatory area)	1.771.283 μm	4.761.116 μm
Mediana	414.592,5	1.132.488,5
Media Group (DP)	442.820,75 μm (168.952,18)	1.190.279 μm (405.817,03)

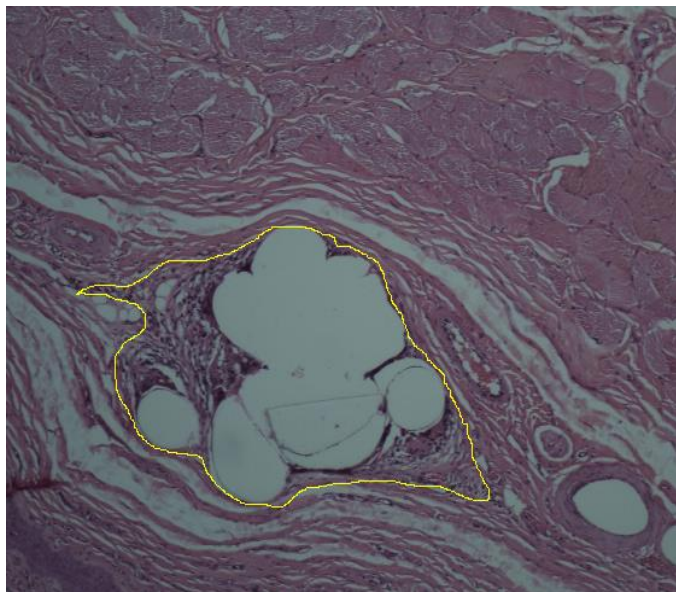
Interpretation of results

The Polyvinylidene Fluoride (Dynamesh) is not usually applied in vaginal surgery. However, our study showed a lower inflammatory process compared to Gynamesh, which has been largely applied in vaginal surgery. Meshes have improved results in prolapse repair and should not be abandoned. There are several new materials being developed, which could improve results without increase complications. The main problem is the lack of pre-clinical trials before introducing new materials in the market. Our preliminary results showed that different materials can generate different inflammatory response. The inflammatory process may facilitate the vaginal mesh extrusion. By applying different meshes, we observed a difference of 62.8% in inflammatory area ($p < 0,01$). Maybe this lower inflammatory process has less morbidity, such as the mesh extrusions, infection and post operative pain.

Concluding message

Meshes should not be abandoned in pelvic prolapse reconstruction. Studies with different materials should be performed in animal models looking for a more suitable material to vaginal procedures.

Figure 1: Figure area inflammatory rabbit of Group 1 (magnification10X)



References

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Disclosures

Funding: none **Clinical Trial:** No **Subjects:** ANIMAL **Species:** Female Rabbit **Ethics Committee:** Comite de ética em pesquisa Hospital São Paulo CEP 078?07