



Editorial

Hernia Mesh and Cancer: Myth, Mystery or Medical Reality?

According to the latest market survey, the global market for hernia mesh devices was estimated at USD 5.01 billion in 2022 and is expected to grow at a compounded annual growth rate of 6.7% from 2023 to 2030.¹

With the rapid growth in its usage globally, the question that is bothering the hernia surgeon is whether the mesh is becoming a predisposing factor for malignancy in hernia patients in the postoperative period. Various isolated case reports in the literature may not justify mesh as an evidence-based etiologic factor in malignancy. However, mesh-related malignancies have been reported without any long-term follow-up data. There are case reports of squamous cell carcinoma of the abdominal wall that arose in patients with long-term infected polypropylene mesh, which may be due to the inflammatory and cell proliferative responses resulting from surgical mesh implantation, leading to neoplasia in the long term by a non-genotoxic mechanism of carcinogenesis.² There is also a report of a Marjolin's ulcer developing after mesh repair of an inguinal hernia without infection.³ A tumor-like reaction resembling the Giant Cell Tumor of the vagina due to polypropylene mesh has been reported in gynaecology, arising from a mid-urethral sling material.⁴ There has been a hypothesis that prior hernia surgery led to an intra-abdominal adhesion, and subsequent pelvic radiation may have facilitated the malignancy invading the mesh, leading to high-grade small bowel obstruction.⁵ In a nationwide observational cohort study, it was concluded that patients undergoing ventral hernia repair with mesh

and patients readmitted after inguinal or ventral hernia repair may have a higher risk of developing cancer than the general population.⁶

The constituents of non-absorbable synthetic mesh, such as polypropylene and polyester, are generally regarded as safe and non-carcinogenic. The main concern lies in how these materials behave over time in the body and their potential to cause localized inflammation or other reactions. Poly-tetrafluoroethylene (PTFE) in its processed form is considered safe, but perfluorooctanoic acid, a chemical used in its production, has been linked to cancer risks. Most of the studies did recommend a long-term follow-up of mesh-induced chronic tissue reactions predisposing to local neoplastic changes.⁷ Though the exact mechanism of carcinogenesis in a mesh in a hernia is unknown, cytotoxic lymphocytes infiltration in a mesh, decreased immunosurveillance in patients undergoing mesh hernia surgery, chronic infection, and altered collagen matrix and genetic variation may be a few predisposing factors. As synthetic mesh is being made by various industries in innumerable countries, it is also important to keep a close check on the quality and mechanical properties of polypropylene meshes, especially on the architecture of the mesh used in repair, plasma treatment, presence of thermosensitive coating, and the process of sterilization.⁸

Since most meta-analyses in hernia studies usually focus only on pain, recurrence, or mesh migration, it is now time to keep a close watch on hernia mesh-related cancer, and every single case of malignancy reported in hernia patients needs strict scrutiny and follow-up. A strict clinical vigilance with early investigation of suspicious red flag signs should be the protocol in any mesh implant patient.

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