



An Evaluation of serum IgE in Atopic patients -predictor for Post-Operative Mesh reaction

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Abstract

Background: *In the modern surgical practice, Hernioplasty remains the commonest surgical procedure in general surgery. Though most of the patient recovers completely without complications, certain number of patients experience a stormy and complicated post-operative period in terms of seroma, infection, pain and last but not the least mesh reaction which is a rare but serious complication. Current day practice involves hernioplasty with polypropylene mesh rather than herniorrhaphy in most surgical centres, hence every effort should be made to reduce mesh related complications. Mesh reactions are more common in patients with preexisting allergic diseases like atopic dermatitis, asthma, allergic rhinitis, seasonal urticarial and also in patients with elevated serum IgE levels. This retrospective observational study was conducted in patients who underwent open inguinal and ventral hernioplasty from March 2010 to Feb 2017 in the Department of General Surgery, Coimbatore medical college hospital, Coimbatore. This study focuses mainly on patients who developed mesh reaction in the post-operative period particularly in patients who have existing atopic manifestations. After analyzing the results of our study, we conclude that IgE antibodies estimation pre-operatively in patients with existing allergic diseases can be used as a predictor for assessing mesh related reactions in the post-operative period. In this continuation we are planning immuno-electrophoresis to pinpoint the gamma globulin associated with mesh reaction.*

Keywords: *Hernioplasty; Mesh reactions; IgE; Atopy.*

Introduction

In the modern surgical practice, hernioplasty remains the commonest surgical procedure in general surgery. Though most of the patient recovers completely without complications, certain number of patients experience a stormy

and complicated post-operative period in terms of seroma, infection, pain and last but not the least mesh reaction which is a rare but serious complication. Hernia surgery, like many other operations, has undergone considerable transformation over the past decade with the

introduction of the use of prostheses. Mesh reactions are rare and late complication which occurs 1 to 2 weeks after surgery in most cases but can occur later in some rare instances^[2]. It assumes importance because it requires re-do surgery and renders the patient a significant morbidity. Current day practice involves hernioplasty with polypropylene mesh rather than herniorraphy in most surgical centers, hence every effort should be made to reduce mesh related complications .mesh reactions are more common in patients with preexisting allergic diseases like atopic dermatitis, asthma, allergic rhinitis, seasonal urticarial and also in patients with elevated serum IgE levels.

Materials and Methods

This retrospective observational study was conducted in patients who underwent open inguinal and ventral hernioplasty from March 2010 to February 2017 in the Department of General Surgery, Coimbatore medical college hospital, Coimbatore. There were totally 430 patients in the study of which 56 are ventral herniae and 374 are inguinal herniae.

Inclusion criteria: all patients who underwent inguinal / ventral hernioplasty on selective basis and recurrent herniae.

Exclusion criteria: Emergency Hernioplasty and herniae other than inguinal and ventral types. This study has been done after informed consent from the patient and they were assessed in a proper manner and operated under perfect anesthetic fitness .This study focuses mainly on patients who developed mesh reaction in the post-operative period particularly in patients who have existing atopic manifestations.

Results

From March 2010 to February 2017, a total of 430 patients have undergone hernioplasty in the Department of General Surgery, Coimbatore medical college hospital, Coimbatore. Out of 430 patients 374 are inguinal herniae and 56 are ventral herniae. Only 7 patients developed mesh

reactions which is 1.62%. Though many patients in the group have existing atopy like dermatitis, rhinitis, bronchial asthma, seasonal urticaria they have not developed mesh reactions. But patients who developed mesh reactions have elevated levels of serum IgE in addition to atopic manifestations. So not all patients with atopy developed mesh reactions but patients who developed mesh reactions have atopy along with elevated IgE. Out of 7 cases who developed mesh reactions, 6 patients have undergone inguinal hernioplasty and 1 patient had undergone ventual hernioplasty of those 7 patients 4 had existing allergic rhinitis, 2 had seasonal urticaria and 1 had bronchial asthma. Post-operative estimation of IgE by immune electrophoresis demonstrated elevated IgE levels in all 7 patients who developed mesh reactions.

Table: 1

	Total	Inguinal	Ventral
Number of Patients	430	374	56
Mesh reactions	7	6	1

Figure: 1

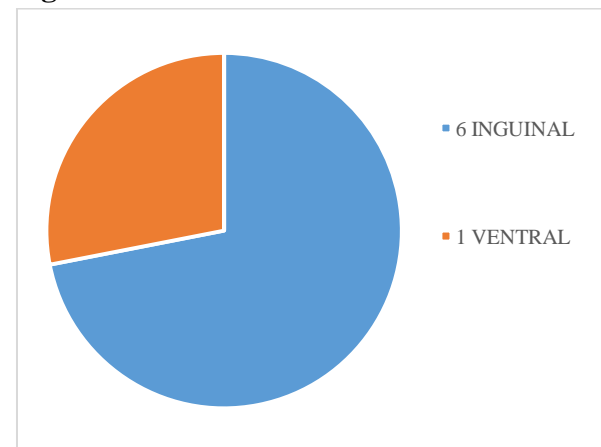


Table 2:

	Total	Inguinal	Ventral
% of mesh reactions 7/430	1.62%	1.39%	0.23%

Discussion

The treatment of groin hernias is of major socioeconomic importance, since 25% of all male and 2% of all female individuals develop an inguinal hernia during their lifetime ^[5].Hernia

surgery, like many other operations, has undergone considerable transformation over the past decade with the introduction of the use of prostheses. Mesh reactions are rare and late complication which occurs 1 to 2 weeks after surgery in most cases but can occur later in some rare instances^[2]. It assumes importance because it requires re-do surgery and renders the patient a significant morbidity. Current day practice involves hernioplasty with polypropylene mesh rather than herniorrhaphy in most surgical centres, hence every effort should be made to reduce mesh related complications. Mesh reactions are more common in patients with preexisting allergic diseases like atopic dermatitis, asthma, allergic rhinitis, seasonal urticarial and also in patients with elevated serum IgE levels. IgE antibodies are naturally produced by B cell lymphocytes and are found in small amounts in the blood, but higher amounts can be a sign that the body overreacts to allergens. Accepted upper limit is between 150 and 300 UI/ml. Elevated IgE Levels are found in patients who have environmental or food allergies. IgE at higher amounts can be a sign that the body overreacts to allergens. Several studies demonstrate MHC/HLA- specific IgE develops during an alloresponse and is functional in mediating immune mechanisms. IgE estimation in the pre-operative time can be used as a predictor for assessing mesh related reactions in patients who have existing allergic diseases^[9]. Common signs of an allergic reaction to hernia mesh include: Persistent or chronic inflammation at the site of the hernia mesh, Warmth or heat at the site of the hernia mesh, Poor healing or fluid buildup at the site of the hernia mesh, Unexplained itching, rashes, hives at or near the site of the hernia mesh, Flu-like symptoms (fatigue, fever, nausea, general ill feeling. Mesh reaction incidence is almost same in both open and laparoscopic methods. Late mesh rejection is a potential complication of TAPP^[1]. There exists a connection between the quantity of material implanted and the immunological reaction to the mesh. There are few studies on the immunological

reaction to polypropylene meshes. Moreover, only one study has been published that clearly correlates the immunological reaction to the amount of prosthetic material, but was carried out on only a few patients^[3]. Hypersensitivity reactions are immune responses that cause tissue injury^[4]. Type IV hypersensitivity is the T cell-mediated response, which for instance is involved in contact sensitivity, chronic inflammation, and graft rejection^[4]. There are few cases on hypersensitivity reactions to meshes in general and only one regarding a quality of mesh used for a hernia repair.

The most used polypropylene meshes induce a rapid acute inflammatory response followed by chronic foreign body reaction. Many factors influence this response such as density, size, physical characteristics, different texture and porosity of each biomaterial^[5]. Some studies indicate that polypropylene multifilament mesh allows a higher intense acute inflammatory response as compared to monofilament mesh implantation^[5]. Different factors can influence the acute inflammatory response to prosthesis implantation. Patients themselves have been identified as an independent factor in the inflammatory^[5]

Host responses to surgical stress are altered with ageing and the occurrence of age-related increase in susceptibility to post-operative complications has been claimed. Elderly humans showed prolonged and strong inflammatory activity compared to younger subjects in response to surgical stress, indicating that the acute-phase response to surgical stress of elderly humans varies from that of the young, showing initial hyperactivity and a delayed termination of the response. Thus, the acute phase response to surgical stress is higher in old subjects, but the clinical significance of this remains unclear^[6]. Conventional inguinal and incisional hernia repair induces an inflammatory response, which is smaller than that observed if both operations are carried out with polypropylene meshes. Furthermore, the results suggest that a larger mesh

is associated with a higher production of inflammation mediators^[7]. The polypropylene prostheses, which are more frequently used, induce a rapid and useful acute inflammatory response as well as a strong scar tissue^[8]. polypropylene and polyester meshes used in hernia repair caused similar inflammatory responses. It was also shown that chronic pain ratios 1 year after the operations were not different regardless of the kind of mesh.^[8]

Conclusion

After analyzing the results of our study, we conclude that IgE antibodies estimation pre-operatively in patients with existing allergic diseases can be used as a predictor for assessing mesh related reactions in the post-operative period. In this continuation we are planning immuno -electrophoresis to pinpoint the gamma globulin associated with mesh reaction.

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