THE IMPACT OF METAL-ION HYPERSENSITIVITIES ON RECURRENCE OF INFECTION AFTER OF THE ONE STAGE TREATMENT FOR PJI

AUTHORS:
THERE WERE NO CONFLICTS OF INTEREST INVOLVED IN THIS STUDY
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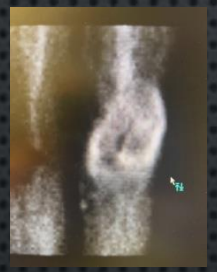
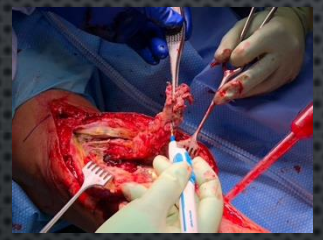
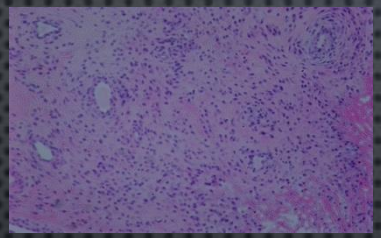
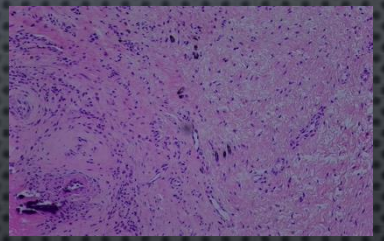
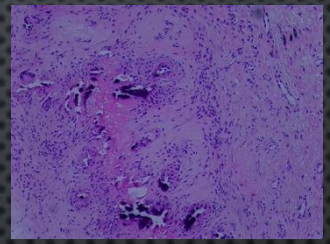
INTRODUCTION: THE ONE STAGE TREATMENT IS NOW RECOGNIZED AS A VIABLE STRATEGY FOR TREATING PERIPROSTHETIC JOINT INFECTIONS (PJI'S). COMPARABLE RATES OF RECURRENCES OF INFECTION ARE SEEN WHEN COMPARED TO THE 2-STAGE TREATMENT. HOWEVER, DESPITE ADVANCES IN TREATMENT RECURRENCES ARE STILL SEEN WITH EITHER THE 1 OR 2 STAGE TREATMENTS OF PJI'S. METAL ION HYPERSENSITIVITIES (MIH) TO THE PROSTHESIS HAS BEEN ASSOCIATED WITH IN INCREASE IN INFECTION RATE AFTER PRIMARY OR REVISION TOTAL JOINTS . MIH IS A TYPE IV HYPERSENSITIVITY TO METAL IONS RELEASED FROM CORROSION OF ORTHOPEDIC IMPLANTS. THIS IS MEDIATED THROUGH THE LYMPHOCYTES WITH ACTIVATION OF CD4/CD8 COMPLEXES AND THE INFLAMMATORY PATHWAYS. IT IS ASSOCIATED WITH CHRONIC INFLAMMATION, SYNOVITIS, SWELLING AND INCREASE IN WARMTH AND ALSO OSTEOLYSIS AROUND A PROSTHESIS. IT IS USUALLY DIAGNOSED BY THE LYMPHOCYTE TRANSFORMATION TEST (LTT). IT IS ASSOCIATED WITH TISSUE NECROSIS AND CHRONIC INFLAMMATION. THE QUESTION IS WHETHER OR NOT MIH IS ASSOCIATED WITH HIGHER RATES OF RECURRENCE OF INFECTION AFTER THE ONE STAGE TREATMENT OF PJI. BELOW ARE PHOTOGRAPHS OF MIH.

METHODS: THIS RETROSPECTIVE STUDY REVIEWED 42 PATIENTS TREATED BY A ONE -STAGE FOR PJI BETWEEN 2022-2023 WITH A MINIMUM OF 2 YEARS FOLLOW-UP OF 2 YEARS. ALL PATIENTS HAD PJI'S BY CONSENSUS 2018 AND 2025 DEFINITIONS. ALL UNDERWENT LTT TESTING AND WERE LISTED AS MIH+ OR MIH -.THE RECURRENCE OF INFECTION AND MIH PREVALENCE WERE COMPARED USING FISHER'S EXACT TEST.

RESULTS: THE INFECTION RECURRENCE RATE IN MIH+ WAS 30% , WHEREAS THE MIH- PATIENTS EXHIBITED A LOWER RECURRENCE OF 13.6%. ALTHOUGH THE RATE OF RECURRENCE IN THE MIH+ WAS MORE THAN DOUBLE THAT OF MIH- GROUP IT WAS STATISTICALLY INSIGNIFICANT (P VALUE =.27). SIMILARLY, COMPARISON BETWEEN PJI RECURRENCE RATE IN MIH+ WAS 30% RECURRENCE IN GENERAL POPULATION OF ONE -STAGE REVISIONS 12%, WAS NOT SIGNIFICANT (P=.11).ON THE OTHER HAND, THE PERCENTAGE OF MIH AMONGST PATIENTS WHO RECURRED WITH INFECTION (67.7%) WAS SIGNIFICANTLY HIGHER THAN THE PERCENTAGE OF MIH IN THE GENERAL POPULATION (1.5-11.4) AS CONFIRMED BY FISHER'S EXACT TEST (P=.006)

CONCLUSION: ALTHOUGH THE STUDY DIDN'T SHOW A STATISTICAL SIGNIFICANCE IN THE INTERGROUP COMPARISON (PROBABLY DUE TO SMALL POPULATION SIZE), THE CLINICAL TREND SUGGESTS THAT MIH+ PATIENTS MAY BE AT HIGHER RISK FOR INFECTION RECURRENCE IN THE POSTOPERATIVE PERIOD. THIS SUGGEST THAT A TYPE IV HYPERSENSITIVITY SEEN WITH MIH IS ASSOCIATED WITH A IMMUNE DEFECT CONTRIBUTING TO RECURRENT INFECTION AFTER ONE-STAGE REVISION FOR PJI'S. WE FEEL THAT LTT SCREENING SHOULD BE PART OF THE PREOPERATIVE WORKUP FOR PJI'S AND THE USE OF HYPOALLERGENIC IMPLANTS SHOULD BE USED IN PATIENTS WITH MIH. FURTHER STUDIES WITH LARGER COHORTS ARE NEEDED TO CLARIFY MIH ROLE IN PJI RECURRENCE AND GUIDE MANAGEMENT.