THE PROBLEM OF TALCUM GLOVE POWDER AND CONTRAINDICATIONS FOR ITS EMPLOYMENT*

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IN SURGERY, as in every other field of endeavor, there is a constant need for resisting the temptation to take anything for granted. True progress demands the discovery and correction of old errors as well as the pursuit of new ideas. New light brought to bear upon an old situation may produce a new fact. Advantage should be taken of every opportunity to re-examine all links in the chain between cause and effect, the old as well as the new. When this is done, the backward glance will often prove to be as rewarding as the forward glance.

These observations are suggested by the results of an extension of the inquiry into the use of magnesium silicate (talcum) as a powder for gloves and other rubber articles extensively used in modern operative procedures.

Until quite recently, magnesium silicate was a substance whose role was never questioned. It played a small but seemingly benign part in the assembly of hands and materials that function in operative procedures.

The studies reviewed in this paper confirm the earlier conclusion that magnesium silicate in its application as a dusting compound for rubber gloves is a mischief-maker that should be eliminated and replaced with a safe and reliable substitute.

It has been previously demonstrated by Lambert[1] and by others[2] that magnesium silicate in the form of dusting powder acts as a foreign body irritant when it gains entrance into the body tissues. The number and the size of the crystals determine the extent of the reaction. One or more fine particles of the silicate will form lesions seen under the microscope as small fibrotic areas. When the powder has been introduced in larger quantities, large and definitely granulomatous lesions with typical foreign body giant cells will be observed.

The trouble-making crystals themselves may then be seen in these lesions between rather dense fibroblastic connective tissue bundles or in the giant cells that are produced as Nature attempts to wall off the offending substance and remove it from the body.

Unfortunately, the attempt at a purge falls short of success. The nature of magnesium silicate is such that the substance may be expected to remain within the tissues once it has found a lodging place, and it will continue to act as an irritant until it is removed.

Our previous reports have described the action of magnesium silicate in producing peritoneal adhesions after abdominal surgery, and also upon its effects

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in other areas, for instance, the nonhealing sinus tracts left along surgical incisions into the deeper tissues.

The finding of magnesium silicate crystals in scars removed by surgery inspired a subsequent study of all old healed incisional scars removed surgically after a period of several months in various hospitals. We have not been surprised to discover that in every scar so removed, definite lesions containing magnesium silicate crystals could be demonstrated.

As a result of these findings we feel free to conclude that many of our cases exhibiting postoperative incisional pain and tenderness may be charged to

Fig. 1.—Small fibrotic area around small nerves in subcutaneous tissue beneath old scar.

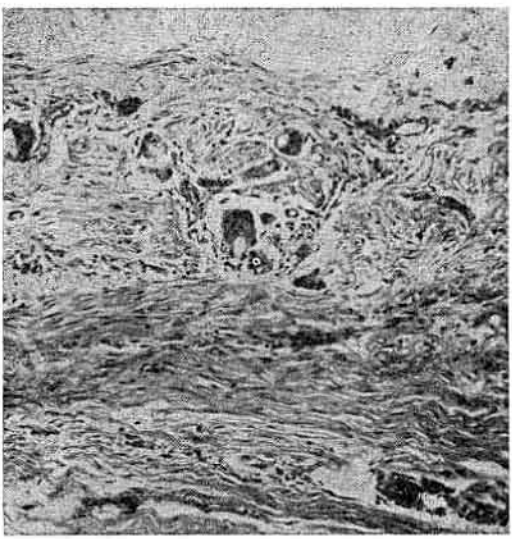

Fig. 2.—Foreign body giant cell and granulomatous reaction; subcutaneous area beneath resected recent operative scar.

inflammatory reaction generated by magnesium silicate crystals deposited by the gloved hands or drains at the time of operation.

Only a partial list of the cases studied in this series is submitted with this report, but we deem it sufficiently conclusive to merit the observation that no reason remains for not giving the situation the attention it deserves.

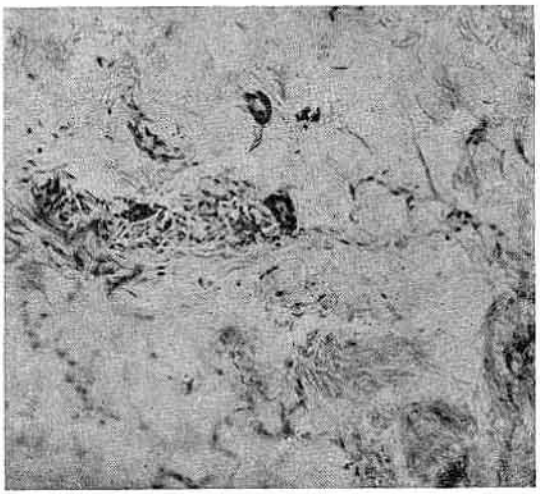

Fig. 3.—Granulomatous and fibrotic area around small subcutaneous vessels. Crystals difficult to see without polarized lighting.

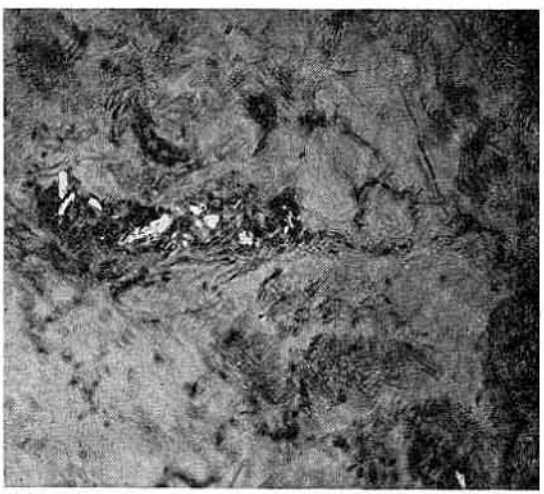

Fig. 4.—Same area as Fig. 3, as seen using polarization of light. Crystals of magnesium silicate plainly visible.

Our viewpoint simply is this — whenever the abdomen has been opened and the omentum or other tissue has been handled by the previously powdered gloved hand of the operating surgeon, careful study will demonstrate the presence of magnesium silicate crystals and a resulting reaction as described.

Beyond that point, there is no need to elaborate upon the previously reported papers covering magnesium silicate reactions. Quite plainly, it should be well recognized by this time that magnesium silicate is a harmful substance and should have no further place in the surgical procedure of our hospitals.

We may look with confidence to chemistry for an alternative substance that will serve the necessary function of a dusting compound without intruding the nonabsorbable and irritating crystalline properties of magnesium silicate. It is desirable that the substitute should be soluble in the body fluids and, at the same time, impervious to change in the sterilizing process.

Until the introduction of a substitute, practical considerations require a technique for avoiding damage for magnesium silicate. We believe that this end can be achieved by a very sparing use of cream of tarter on the hands before they are inserted into the gloves and by thorough washing of the hands after they have been gloved.

The technique we have devised for use in St. Vincent's Hospital is as follows:

1. Only enough magnesium silicate powder is applied to the inside of the gloves before dry sterilization to avoid the adhesion of their surfaces during the sterilizing process.
2. Cream of tarter is applied to the hands in small quantities, enough to assist the hands into the sterile gloves.
3. All powder remaining on the external surface of the gloves is removed by washing through two basins of sterile water.
4. All other rubber articles required in the operation are sterilized by boiling, and no powder applied.

This procedure appears to remove all but the smallest particles of the magnesium silicate powder. We submit that its observance pending the development of a substitute powder will produce a proportionate reduction in the number of postoperative lesions.

We submit several microphotograph findings in excised old and recent scars studied since 1943 at our institution, taken from the last one hundred cases.

The use of Polaroid in two planes of the microscopic light source in the manner suggested for our polarizing microscopes will aid materially in finding magnesium silicate crystals in the tissues.

Accessory parts for this purpose, cap polarizers and disc polarizers, are available and can be used with any of our modern microscopes. Properly rotated, they polarize the light in such a manner that any refractile substance in the path of the rays will be brought into clear vision. Without polarized light, many small crystals will remain invisible. Large crystals in giant cells may be observed with ordinary illumination, but in many cases cannot be studied in satisfactory detail without polarized light.

Summary

We have again called attention to the harmful effects of magnesium silicate when introduced into the body tissues in the form of surgical glove powder.

We have presented a study of resected postoperative incisional scars and omental fat showing chronic granulomatous lesions with foreign body reaction and crystals of magnesium silicate in practically every case.

We urge the adoption of a technique to minimize the hazards of magnesium silicate in surgery.

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