



Vesicoureteric Reflux

*Clinical and Laboratory Research
Including
Investigation of the Role and Risks of Plastics*

A Thesis for the Degree of Doctor of Philosophy
in the University of Adelaide

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Summary

The understanding of vesicoureteric reflux (VUR) has still only reached the level of "expanding ignorance". This state of affairs is because past workers have often drawn conclusions which, in retrospect, have been based on inadequate evidence. The Ransley and Risdon theory of the "big bang" is one of the best examples, where the renal injury was attributed to the first infection: it has now come to light, with the advent of frequent use of pre-natal ultrasound, that many of those with VUR have abnormal renal parenchyma before infection has occurred [1].

This study was undertaken to review the outcome of the application of new technology for the endoscopic management of VUR and, more importantly, to investigate how the subcutaneous tissue, lung and brain of animals respond to Teflon and silicone. The results, and the literature, indicate that injections under the ureteric orifice can cure VUR and that the tissue response to the plastics becomes quiescent. The question of malignant risk remains open, but the risk would appear low, possibly lower with the smaller Teflon particles than for the larger silicone microspheres.

The research into embolisation from solid implants from intravenous tubing and the possibility of antibody formation to implanted plastics were included, to place the use of injectable plastic in perspective with other clinical uses of plastics: the patient with migration of Teflon to the skin was included to highlight the need for caution in the use of plastic injection techniques. This subgroup of experiments indicates that particles are shed into the blood stream during routine paediatric intravenous infusions, and remain in the patient when the sheath around an implantable device remains *in situ* after removal of the implant.

The operation of open ureteric reimplant for the treatment of VUR is well established; thus there was nothing new in achieving reflux resolution for the patients thus treated

in Adelaide. However, finding improved renal growth after ureteric reimplant for high grade VUR is noteworthy, and the clarification of the debate on the issues surrounding the management of VUR is long over-due.

The next experimental step was to embark on the development of a model of fetal VUR, and the pursuit of information on pre-natal diagnosis of renal anomalies. These studies will hopefully open the door to further research which will help clarify our understanding of the pathophysiology of VUR. It would appear that kidneys do undergo progressive adverse changes *in utero*, possibly secondary to VUR.

The greatest achievement of this study may have been the *further* expansion of my ignorance! I have found more questions than answers and hope to have stimulated others to look for answers, rather than jumping to conclusions.