

## Humanitarian hernia surgery - 10 years of personal experience and the safety of LDPE mosquito mesh. Bystřický P. Departement of Surgery, Nemocnice České Budějovice, Czech Republic.

### Introduction

Many people from low-income countries suffer from late or no treatment of incarcerated hernias. That can cause permanent consequences or even death. Hernia International is a 100% volunteer organisation, delivering humanitarian hernia surgery in the countries of the third world. A LDPE mosquito mesh („low-cost mesh“) is widely used. Its safety and full functionality was described. The cost of such mesh is a fraction of the cost of the commercial mesh.

### Methods

Due to doubts about the content of heavy metals, a LDPE mosquito mesh was a subject of testing for heavy metal content; the same-size piece (15x15cm) of a mosquito mesh, and a standard commercial mesh, were tested by graphite furnace atomic absorption spectroscopy. As shown in table I, there is no difference in the content of heavy metals in tested meshes, except of nickel; but the detected level was very low.

Table I	LDPE Mosquito mesh	Commercial large-pore polypropylene mesh
Lead	Less than 10 mcg/kg	Less than 10 mcg/kg
Chrome	Less than 10 mcg/kg	Less than 10 mcg/kg
Nickel	111,08 mcg/kg */	63,4 mcg/kg */
Others (copper, zinc, arsen, selenium, quicksilver)	Not detected	Not detected

Content of heavy metals in LDPE Mosquito mesh and commercial polypropylene mesh. GFAA spectroscopy, Chemická a mikrobiologická laboratoř Písek. Akreditace č. 327/2015

\*/ Daily nickel intake in the diet: hundreds of micrograms



Set for inguinal hernia repair



Local anaesthesia



Serilised LDPE Mosquito Mesh



Lichtenstein technique for bilateral direct hernia



Patient leaving OR after surgery



Sterilisation in Africa

I have had the chance to join 11 international voluntary teams in the years of 2011-2019. More than 1000 procedures were performed by international teams, including large inguinoscrotal, incisional, umbilical, and pediatric hernias. The conditions were often very basic, and a LDPE mosquito mesh and local anaesthesia were used in most adult cases. A combination of a tension-free technique and a local anaesthesia seems to be a very effective method. In most cases, patients were discharged at the same day after surgery.

Meshes were autoclaved at 121 Celsius degrees before missions in standardized conditions in the U.K. hospitals and kindly sent by Prof. A. N. Kingsnorth. Although some articles show the influence of sterilisation on mesh characteristics, we do not have this experience.

### Results

The spectroscopy shows comparable presence of heavy metals in the polyethylene mosquito mesh, in comparison with a standard polypropylene mesh.

The postoperative follow-up is difficult to reach. In the co-operation with local surgeons, a very low number of early post-op complications, such as haematoma and wound infections were recorded (less than 1%).

At least one (but sometimes more than 10) young local surgeon or a medical student during every mission were trained in basic hernia procedures.

### Conclusions

Hernia International provides a high-quality surgical care to the patients from the low-income countries. Using a mosquito mesh is a safe and effective method with a comparable low complication rate but with minimal costs.

An adequate microbiological and biomechanical characteristics of different types of mosquito meshes should be investigated.