A new, safer and cheaper artificial duct for anastomosis

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Researchers from the University of Granada and the Andalusian regional Health Service (ServicioAndaluz de Salud) have patented a new device for use in procedures that involve anastomosis. It consists of an artificial duct which makes complex, expensive surgical techniques entailing high mortality, quite unnecessary.

The device in question is a three-dimensional tube constructed from a reabsorbable, biocompatible material–preferably collagen–which is morphologically and functionally similar to the native duct and can take its place.

Anastomosis is the surgical connection between two structures, generally tubular, like blood vessels or intestinal loops For example, when part of the intestine is removed in surgery, the two structures are sutured or stapled together. This procedure is known as an intestinal anastomosis.

The device patented by the UGR has highly porous surface and is covered with a material that permits macromoleules like agarose hydrogel, gelatine, chitosan, hyaluronic acid or alginate acid–to migrate through it.

It could be used in surgery, especially in anastomoses of the gastrointestinal tract: the bile duct, biliary tract, intestines, pancreatic ducts, esophagus or colon.

Experiments in animals

University of Granada researchers Alejandro Pérez Alonso and Pablo TornéPoyatos, the authors of the patent, say that to date they have experimented with interpositions of the device in bile duct anastomosis in experimental animals.

"Morphologically,the grafts functioned like the native bile duct from four weeks after the graft. Current studies are looking into the histology and immunohistology of the device. Preliminary results suggest that the tissue disposition is similar with analogous antigen expression". However, both researchers stress that these are very early results and require further research.

These results demonstrate that new therapeutic approaches to the treatment of conditions confined to the extrahepaticbiliar tract are possible–avoiding the need for complex surgical techniques entailing high socio-economic costs and high mortality.

This new approach, patented by the UGR and the Andalusian Health Service avoids complex surgical techniques, cuts socio-economic costs and high mortality, could be easily available and easy to reproduce with low production costs. The devicesmaintain the functionality, physiology and morphology ofthe native duct from the time of implantation.

This patent represents an important step forward. Now, the UGR scientists are seeking to cooperate with pharmaceutical companies and public and private institutions in the sector who want to take this line of research forward.

More information: "Reconstrucción del conducto biliar mediante tubos tridimensionales de colágeno," *Cirugía Española*, Volume 91, Issue 9, November 2013, Pages 590-594, ISSN 0009-739X,

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