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Researchers unravel mechanism behind bowel paralysis after surgery

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In the days following abdominal surgery, patients' intestinal contents pass more slowly or not at all. New research at KU Leuven (University of Leuven), Belgium, has now shown that this phenomenon—known as post-operative ileus or bowel paralysis—is not caused by the cells previously identified as the main players. Quite the opposite, in fact: the cells even help restore bowel function. The findings are very important for further research into post-operative patient treatment.

After undergoing abdominal surgery, patients have to stay in hospital for several days because the procedure causes post-operative ileus or bowel paralysis. As a result, the patients cannot tolerate food or empty their bowels. This leads to personal discomfort and prolongs the hospital stay, which in turn increases the economic cost.

Scientists have long been looking for ways to prevent bowel paralysis or to speed up bowel function recovery. The assumption has always been that monocytes, a specific type of white blood cells, were most to blame for the bowel paralysis. Professor Gianluca Matteoli and Professor Guy Boeckxstaens from the TARGID unit at KU Leuven have now shown that the opposite is true.

"Abdominal surgery always leads to a subtle inflammation of the intestinal muscle. This inflammation mostly consists of monocytes," says Professor Matteoli. "We did research on mice that were genetically modified to make it impossible for monocytes to leave the bloodstream and enter the intestinal muscle. We expected that this would enable us to

prevent bowel paralysis. To our surprise, however, the mice still developed bowel paralysis, and their recovery was even slower than expected."

Further research confirmed that monocytes have a positive impact on bowel function recovery. "We noticed that monocytes initially contribute to inflammation. After a while, however, they start removing the damaged tissue—they clean it up, so to speak. After that, their function drastically changes and they even help to restore proper bowel functioning," Professor Boeckxstaens continues. "If we can speed up this switch from cleaning up to restoring, we may also increase the pace of the patient's recovery."

More information: Giovanna Farro et al, CCR2-dependent monocyte-derived macrophages resolve inflammation and restore gut motility in postoperative ileus, *Gut* (2017). DOI: 10.1136/gutjnl-2016-313144

Provided by KU Leuven