Surgical procedure as an inducer of tumor angiogenesis.

Surgical resection is the main treatment modality for the vast majority of patients with locally confined solid tumors. The healing process following surgery necessitates extensive angiogenesis which can be a clinical challenge due to its tumor-promoting effect. In line with this, plasma (serum) levels of several pro-angiogenic factors such as vascular endothelial growth factor (VEGF) and angiopoietin 2 were found to be significantly increased after surgical tumor resection. Furthermore, increased levels of these proangiogenic factors seem to correlate with the extent of surgical wounding; yet, it remains unknown whether minimal-invasive surgery is superior to open surgery in terms of avoiding the pro-angiogenesis response. Derived from various sources (e.g. endothelial cells, cancer cells, fibroblasts and/or immune cells), an increase of these pro-angiogenic factors can occur as early as day one postoperatively and they can remain persistently elevated for up to four weeks. The presence of such proteins not only supports a microenvironment favorable for tumor growth and metastasis, but also protects tumor cells from conventional chemotherapy. Therefore, initiation of anti-angiogenesis therapies has been proposed for the early postoperative period before the start of conventional chemotherapy. Because such a treatment would potentially affect wound and anastomotic healing, the long-term effects and safety issues associated with early postoperative...
anti-angiogenic therapy require further investigation.