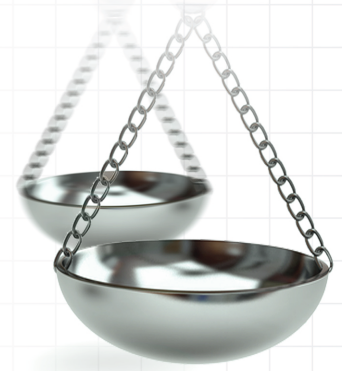




# Letter to the Editor: critical appraisal to optimize clinical and economic impact of oxidized regenerated cellulose in surgical practice

Journal of **Comparative Effectiveness Research**

Gianluca Franceschini<sup>\*1</sup> 

<sup>1</sup>Fondazione Policlinico Universitario Agostino Gemelli IRCCS, Università Cattolica del Sacro Cuore. Multidisciplinary Breast Unit, Department of Woman & Child Health & Public Health, Largo Agostino Gemelli, Rome 800168, Italy

\*Author for correspondence: [gianlucafranceschini70@gmail.com](mailto:gianlucafranceschini70@gmail.com)

First draft submitted: 7 January 2021; Accepted for publication: 19 March 2021; Published online: 21 April 2021

**Keywords:** clinical outcomes • complications • hemostatic biomaterial • hospital costs • oxidized regenerated cellulose • surgery

I read the interesting article of Qian *et al.* [1] and would like to make some observations to optimize the clinical and economic impact of oxidized regenerated cellulose (ORC) in surgery.

ORC is considered an optimal local hemostatic biomaterial thanks to ease-of-use, favorable biocompatibility, bioabsorption characteristics and bactericidal activity. Recently, ORC has also been used with additional indications to repair wounds and reconstruct tissues [2].

Qian and colleagues report that ‘when compared with conventional hemostatic technique, using ORC could impact blood transfusion and hospital costs differently by surgical settings’ [1]; in their study, ORC seems to determine lower blood transfusion volume and lower hospital costs than nonORC in endoscopic transnasal sphenoidal surgery, nonskull base craniotomy, hepatectomy, cholangiotomy, gastrectomy and lumbar surgery [1].

However, I think that, in order to obtain a proper and complete assessment of ORC performance, it is necessary to consider potential benefits but also some possible problems that can cause a negative impact on clinical and economic outcomes.

Similarly to other biomaterials, ORC can produce allergic reactions, seroma due to redundant digestion and foreign-body reaction with risk of extrusion as consequence of not optimal bioabsorption [2,3]. We proved high rate of red syndrome, mainly presenting as eczema and acute dermatitis, significant postoperative seroma and a case of foreign body reaction that required surgical removal in breast-conserving surgery [4]. Rare cases of foreign body reaction or impingement on nerve are also reported in other surgical settings [2,5]. These complications may undermine clinical results and lead to delay the beginning of any important oncological treatments with a negative impact on patient quality of life, survival and hospital costs.

Furthermore, adverse conditions due to retained ORC may pose some diagnostic dilemmas and determine further hospital charges [5]; fibrogenetic action induced by ORC and its partial reabsorption can determine peculiar radiological findings that can lead to misdiagnosis during the follow-up with the need of further diagnostic examinations and additional costs. In our experience, a mass with well-circumscribed margins was observed on mammography while ultrasonographic examination showed a typical round image (called ‘île-flottante’) [2,4]; diagnostic interpretations varied from tumoral disease to local abscess, hematoma sequale or area of fat necrosis; sometimes a magnetic resonance and core needle biopsy was necessary to achieve a detailed diagnosis.

However, the performance of some standardized tasks may be important to prevent issues associated with ORC and optimize clinical and economic outcomes: surgeon should perform appropriate selection of candidates to surgery with ORC; hemostatic agent should not be used in patients with specific comorbidities as noncontrolled diabetes mellitus or treated with neoadjuvant chemotherapy due to higher risk of postoperative infections; ORC should not be placed directly below surgical suture to minimize the risk of its extrusion; surgeons should carefully calibrate the amount of ORC to be used; ORC pieces must properly fill the surgical cavity without being overblown

to avoid foreign-body reaction; management of postoperative complications should start as soon as possible with antihistamine and steroids medications in case of red syndrome and with repeated percutaneous aspirations of excessive seroma to quickly resolve the issues and prevent delays in adjuvant treatments; the use of ORC should always be described in the report of surgical procedures, so that radiologist can properly interpret the peculiar imaging due to this biomaterial and avoid misdiagnosis with further expensive investigations during the follow-up.

In conclusion, I believe that the acquisition of adequate expertise with ORC and compliance with some specific recommendations are mandatory to reduce issues due to this hemostatic agent and optimize clinical and economic performance.

#### Financial & competing interests disclosure

The author has no relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript. This includes employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties.

No writing assistance was utilized in the production of this manuscript.

#### References

1. Qian Z, Xiong F, Xia X *et al*. Clinical and economic impact of oxidized regenerated cellulose for surgeries in a Chinese tertiary care hospital. *J. Comp. Eff. Res.* 9(15), 1079–1090 (2020).
2. Franceschini G. Internal surgical use of biodegradable carbohydrate polymers. Warning for a conscious and proper use of oxidized regenerated cellulose. *Carbohydr. Polym.* 216, 213–216 (2019).
3. Franceschini G, Visconti G, Sanchez AM, Di Leone A, Salgarello M, Masetti R. Oxidized regenerated cellulose in breast surgery: experimental model. *J. Surg. Res.* 198(1), 237–244 (2015).
4. Franceschini G, Visconti G, Terribile D, *et al*. The role of oxidized regenerate cellulose to prevent cosmetic defects in oncoplastic breast surgery. *Eur. Rev. Med. Pharmacol. Sci.* 16(7), 966–971 (2012).
5. Piozzi GN, Reitano E, Panizzo V *et al*. Practical suggestions for prevention of complications arising from oxidized cellulose retention: a case report and review of the literature. *Am. J. Case Rep.* 19, 812–819 (2018).