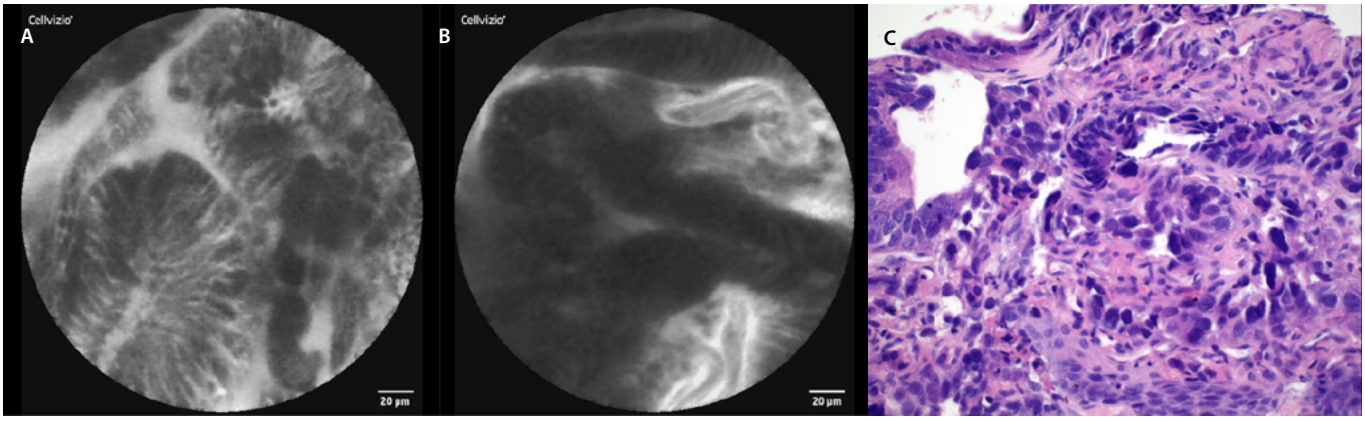
Fig. 7. *pCLE view of esophageal adenocarcinoma: a – disorganized structure, dark columnar cells with severe nuclear atypia (anisokaryosis), b – disorganized structure of the gland with dark columnar cell and dilated irregular vessels; c – histopathology examination: neoplastic glands show highly irregular architectural glandular arrangement and sever nuclear atypia, haematoxylin-eosin staining 40×*



for endoscopic resection were examined by pCLE before the resection. The study revealed additional neoplastic tissue when compared with the prior HD-WLE and narrow band imaging (NBI).

Promising data is also available from two meta-analyses published in 2016 a 2018, both published by Xiong from China. In 2016 his meta-analysis confirmed that pCLE can be applied to BE surveillance and can lead to the early diagnosis of EAC (35). His recently published analysis from 2018 highlighted significantly increased esophageal neoplasia detection when compared to NBI alone (36).

Performing pCLE in the distal esophagus can sometimes be difficult. However, using a cap at the end of the endoscope can help and improve the stabilization of the probe and the final pCLE image (14). Adverse effects or allergic reactions to the contrast agent Fluorescite® have been studied in 2 272 patients (from 16 international centers in total) who underwent pCLE in the gastrointestinal tract. No serious adverse events were reported. Mild adverse events occurred in just 1.4 % of individuals, including nausea/vomiting, transient hypotension without shock, injection site erythema, diffuse rash, and mild epigastric pain (37). In our group we did not record any side effects after the application of the contrast agent. Another relative disadvantage can be the higher purchase price and operational costs. On the other hand, using pCLE during an endoscopy can lead to a decrease in endoscopic procedures and the amount of biopsies taken, potentially reducing the costs (13, 26).

As well as pCLE there are other experimental methods currently in development. De Groof et al (38) published a method of computer-aided detection of early BE neoplasia in 2018. This method also enables real-time detection and locates BE neoplasia on endoscopic images with high accuracy. However, more experience, data and further development of the algorithm for the video evaluation performed in this new technique are needed.

A possible limitation of our study is the low number of patients investigated. However, the aim of this pilot study has been to gain experience with pCLE in esophageal diseases and obtain characteristic pCLE figures for future studies.

Conclusion

Endoscopic detection of neoplasia in BE (especially in long segments) is challenging and advisable in managing surveillance in expert centers for BE.

We studied and established basic pCLE figures for esophageal diseases during a standard cap-assisted endoscopic procedure. It seems to be a possible new technique in BE surveillance and early neoplastic lesion detection. However, more studies and data on larger numbers of patients are needed.

Ethical standard statement

All procedures which followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008.

Informed consent

Informed consent was obtained from all patients for being included in the study.

Conflict of interest

The authors declare that they have no conflict of interest.

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