

Comparison of conventional cervical cytological sampling (Ayre's spatula, endocervical brush) and the PapCone[®] as seen by scanning electron microscopy

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Introduction Efforts to improve Pap smear performance have recently focused on reducing the number of false negative smears, i.e. cases in which premalignant or malignant cells have been misdiagnosed as normal. Considering that the basis for a good quality cervical smear is a correct sampling method, a variety of technologies or clinical strategies have been proposed to improve Pap testing including various devices for collecting cytological cervical samples, such as the PapCone[®] (Otto Bock, Duderstadt, Germany). The PapCone[®] is a cone-shaped polyurethane (foam) sampling device designed by the University Hospital Göttingen (Germany) to obtain simultaneously cells from the ecto- and the endocervix. It has the properties of a soft brush and at the same time it acts as a soft spatula by being pressed to the ectocervix.

Aim We evaluated the ultrastructure of human cervical cells by means of scanning electron microscopy (SEM), comparing the samples obtained with the PapCone[®] with the traditional wooden Ayre's spatula (S) and the endocervical cytobrush (C).

Materials and methods Twenty-two adult fertile (under 40 y), primiparous women were submitted to traditional Pap test (by S and/or C) and to PapCone[®] sampling 3 months after, with the related informed consent. Ultrastructural features of the 3 devices were analysed by SEM before and after sampling. Specimens were fixed in 2.5% glutaraldehyde in 0.1M PBS, stored at 4°C, postfixed in 1% osmium tetroxide, and dehydrated in increasing ethanol concentrations. Specimens were critical-point dried with carbon dioxide, mounted on aluminum stubs, coated with platinum, and observed with a Hitachi S-4000 FE-SEM (20 kV).

Results SEM allowed to recognize large and flattened ectocervical cells with micro-plicae from cylindrical and smaller endocervical cells. However, S and C appeared less useful in case of abundant presence of mucus. The PapCone[®] surface was porous, partly occluded by membranes, and divided by trabecles lodging sampled cells. S showed a finely regular surface, sometimes showing wooden chips, and cells appearing clustered in usually overlapping groups. C often entrapped cells at or among the bristles, wherein red cells were usually noted. PapCone[®] showed lower bleeding and less overlapping cell layers in comparison with S and C.

Conclusion PapCone[®] is a good and low traumatic method for sampling cervical cells, that can be useful especially in case of flogosis or cervical bleeding.

Key words

Uterine cervix, PAP test, scanning electron microscopy, cervical cytology, transformation zone