Our Experience with Cellient™ Cell Block system in a setting of established traditional cell block method

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**Introduction**

Traditional cell-block (TCB) plays an important role as a diagnostic adjunct to smears in cytology. TCB has been proven reliable for cytomorphology and immunocytochemistry (ICC). Many cell block methods exist, including automated cell block method, and they continue to be revised with time.

**Objectives**

To compare Cellient™ automated cell-block system with TCB, made using Thromborel-S and expired fresh frozen plasma (FFPE), to evaluate cell morphology and ICC staining.

**Materials and Methods**

101 Non-Gynecological (NG) cases were selected for this study, 6 were aspirates taken for NG ThinPrep® alongside concurrent biopsies. Body fluids (n=95) formed the main bulk of specimens and majority were malignant to emphasize on cytomorphology and ICC staining evaluation. Cell blocks (CB) were prepared according to the laboratory’s TCB and Cellient™ protocols.

**Cellient™ Cell Block Sample Preparation**

1. Centrifuge fluid at 2,800rpm, 5mins.
2. Decant supernatant & resuspend pellet in 30ml Cytolyt
3. Leave to stand for 10min & vortex at 2mins intervals
4. Centrifuge at 2,800rpm, 5mins
5. Repeat steps 2-4
6. Decant supernatant & ensure pellet is dry
7. Add 2-4 drops of cell pellet to ThinPrep Preservcyt vial & fix for 15mins
8. Process the vial using Cellient™ Cell Block System

**Instructions to Histology Section for cutting (Cellient™ Cell Block)**

1. Cool the Cellient™ cell block for at least 10min before cutting
2. Air dry the slides for 30mins followed by 5min in 60 degrees oven before staining

**Traditional cell-block (TCB) Preparation**

1. Centrifuge fluid at 2,000rpm, 10min.
2. Decant supernatant & mix pellet with 10ml 4% buffered formalin.
3. Fix for 2hrs (6hrs for breast primary)
4. Centrifuge at 2,500rpm, 10mins
5. Decant supernatant & wash pellet with 0.9% saline solution
6. Centrifuge at 3,000rpm, 10mins
7. Decant supernatant & mix pellet with Thromborel S & FFPE
8. Allow the pellet clot & send to Histology for passing & embedding processes.

**Results and Discussion**

Cellient™ CB significantly reduced the preparation time to half (fixation time required was only 15 minutes & did not require passing & embedding), and the cost was comparable to TCB.

Majority of the Cellient™ CB preparations examined showed well-preserved, comparable cytoarchitecture (n=68/101, 58.4%) and similar yield to TCB (n=74/101, 73.3%), with sharp nuclear details and discernable nucleoli in many cancer cases. However, mild to sometimes moderate fragmentation was noted (n=90/101, 89.1%), which seemed to improve with slight changes in procedural protocol (with an additional CytoLyt wash step). Cell discohesion was more noticeable compared to TCB. For the benign cases, no significant differences were observed.

A variety of common ICC stains were performed in malignant cases, and majority were comparable with those performed on TCB. A few ICC stains showed decreased staining intensity, notably BerEP4, TTF-1 & Mammaglobin (which in addition, shows peripheral staining in clusters of cells).

**Conclusions**

The Cellient™ CB showed comparable cytomorphological patterns to TCB, but there were some differences in the ICC staining intensity and pattern, albeit their numbers were very small. Cellient™ CB shows a potential as an alternative CB method when a rapid reporting is necessary. Further modifications may be required to optimize the tumour cell yield and immunocytochemical staining.