中文題目：胃液 PCR 測定法在治療過的幽門螺旋桿菌感染的運用

英文題目：GASTRIC JUICE-BASED PCR ASSAY: AN IDEAL SOLUTION TO THE CLINICAL UNMET NEED IN THE MANAGEMENT OF TREATMENT-EXPERIENCED *HELICOBACTER PYLORI* INFECTION

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**Background:** *Helicobacter pylori (H. pylori)*culture has been strongly emphasizedin the setting of eradication failure because retreatment strategy can be tailored based on the antibiotics susceptibility test from culture. However, eradication failure makes the subsequent diagnosis much more difficult and many diagnostic tools including culture yield low accuracy in treatment-experienced *H. pylori*infection. The current clinicalunmet need for the management of treatment-experienced *H. pylori*is one clinical method with satisfying diagnostic accuracy as well as the ability to perform the reliable antibiotics susceptibility test to guide subsequent tailored therapy. Gastric juice-based PCR is able to provide both diagnosis and antibiotics susceptibility test; however, whether treatment failure affects the diagnostic accuracy, as with other diagnostic tools, remains uninvestigated. Our study aimed to investigate diagnostic accuracy of gastric juice-based PCR intreatment-experienced *H. pylori*infection, evaluate antibiotics susceptibility test from the gastric juice PCR-RFLP method, and compare the results with those of culture, which is the currently emphasized method in clinical guidelines.

**Method and Material:** We included 547 patients and categorized them into four groups based on their previous treatment history: treatment-naïve, post 1$^{st}$treatment, post 2$^{nd}$ treatment and post 3$^{rd}$treatment. The status of *H. pylori* infection was confirmed according to the following clinical gold standards: concordant positive histology and rapid urease test or positive urease breath test. We performed gastric juice-based PCR and culture in each subject and then calculated the sensitivity, specificity, positive predictive value, negative predictive value and accuracy of gastric juice-based PCR as well as culture method. ROC curves of gastric-juice PCR and culture in each subgroup were shown as well. To explain the different accuracies of gastric-juice PCR and culture, we referred to the updatedSydneyclassification to evaluate *H. pylori* density within corpus and antrum in each *H. pylori*-infected patient and demonstratedintra-gastric *H. pylori*distribution after treatment. Lastly, we compared the antibiotics susceptibility results of gastric juice PCR-RFLP with those of E-test to show the reliability of the results.

**Result:** Our findings demonstrated that the AUC of gastric juice PCR was higher than that of culture in all patients (96.7% vs91.3%, $p < 0.0001$). Further analysis showed the superior AUC of gastric juice PCR to culture in Tx-experienced patients (98.8% vs86.4%, $p < 0.0001$), in patients post 1$^{st}$ treatment (96.8% vs71.0%, $p < 0.0001$), in patients post 2$^{nd}$ treatment (96.4% vs79.2%, $p <$

*0.0001*) and in patients post 3rd treatment (100% vs65.4%, *p = 0.0004*). In treatment-naïve patients, there was no statistical significance in both AUCs. (Gastric juice PCR= 95.4%, culture=92.5%, *p = 0.13*). In *H. pylori*-infected patients, the *H. pylori* positivity rate on the antral biopsy specimen was lower in Tx-experienced patients than in Tx-naïve patients. (85.5% vs 80.7%, p=0.011) and antral *H. pylori* density was less marked in Tx-experienced patients as well (p=0.014). The comparisons of PCR-RFLP and E-test to detect Clarithromycin resistance showed the reliable AUC = 89.8% (95% CI=84.2-95.4).

**Conclusion:** The gastric juice-based PCR yields more accurate diagnosis in Tx-experienced *H. pylori* than culture and provides areliable antibioticssusceptibility test to guide subsequent retreatment therapy. Compared with culture, which is currently regarded as the gold standard in clinical guidelines, the gastric juice PCR contains the strengths of performing the antibiotics susceptibility test and overcomes the shortcomings of low diagnostic accuracy of the culture method. Consequently, gastric juice PCR suits the current unmet need for the management of treatment-experienced *H. pylori* and has very promising potential for widespread application.