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Efficiency and diagnostic reliability of telepathology consultation

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Abstract

Introduction: Telepathology (TP) has become a well established tool to deliver histological and cytological diagnosis at a distance and to assess second opinion consultations. The efficiency and reliability of a TP-assisted diagnostics compared to conventional diagnostic procedures are crucial for a broad practical use.

Material and methods: The evaluation of remote diagnosis and consultation in pathology is based on long-standing experiences with an Internet-based TP-system (iPath, http://telemed.ipath.ch). The results are derived from two representative user groups: (1) SHCH (Telepathology at the Sihanouk Center of Hope, Cambodia) and (2) HPF (Histopathology Forum). SHCH is a closed user group for remote diagnosis. It consists of two referring colleagues in Phnom Penh and a panel of established experts from Europe. HPF is a place for discussion of challenging cases in histopathology. It is open for referring pathologists and consultants from different countries. Until now more than 1100 cases have been discussed over the last three years.

Results: To assess the reliability of a store- and forward TP-system between SHCH in Cambodia and consulting pathologists in Europe the original glass slides were reviewed and compared with the TP diagnosis. In the first year of the project (2003) for 179 of 212 specimen (84,4%) the TP diagnosis was completely identical with the review diagnosis on the original glass slide. Eighteen (8,5%) and five (2,4%) specimen showed minor and moderate disagreement, respectively. Only seven cases (3,3%) exhibited a major disagreement.
The analysis of 177 specimen from the ensuing year (2004) revealed an increase to 89,8% for cases with a complete agreement and a decrease to 1,1% for cases with marked diagnostic discordance.
An analysis of the potentially influential factors exhibits that the diagnostic accuracy significantly correlated with the appropriate selection of images ($p<0.001$) and the quality of communication ($p<0.001$).
The discussion of problematic cases in the HPF resulted in a clarification or confirmation of the diagnosis in about 70%. Twenty five percent of the submitted cases were finished with a differential diagnosis or a tentative diagnosis. About five percent of all cases could not be clarified due to inadequate image quality and other reasons.

Conclusions: The results emphasize the efficiency and reliability of a TP service for hospitals in developing countries as well as for second opinion consultations. The main problems of inadequate image selection and communication deficiencies can be overcome or diminished by training and experience.