Results: 605 consultations were performed for 147 patients over 44 months from TCC to five satellite centres. All centres are located in remote areas with distances ranging from 400 to 1200 kms from Townsville.
54 consultations were done in the first year of the project. 129, 136 and 286 consultations were done in subsequent years respectively. 16% of patients were from indigenous community. Breast and lung cancers were the most common types (73%). Intravenous chemotherapies were given at two centres post teleconsultations.
In the first year of the project, the cost was 30% higher than the potential benefit. Again in 2009, when 3 new sites were enrolled, the cost increased by 20% over the expenses prevented. Overall in four years, the total cost was 463,748 A$, while the estimated expense prevented was 855,660 A$ resulted in a net saving of 391,912 A$.
Conclusions: Our study clearly shows that the teleoncology clinics save money to the health system and patients while providing efficient cancer care to rural Australia. It is beneficial after first year of establishment and with more than 100 consultations per year. Equipment and staffing costs are the main costs (74%) while avoidance of patient travel and urgent transfers are the key factors of the benefit (83%). Cost rises temporarily when new centres are enrolled. Overall, more consultations at multiple satellite centres give maximum benefit.
Other benefits: Time and energy saved by the patient and escort, avoid delay in seeing patient and starting treatment, reduction in clinic workload at home site, avoid unnecessary transfer and better communication with the remote doctors.

Cost of telemedicine

Type of cost	Cost per centre (A$)	Cost for six centres for four years (A$)	Total(A$)
Project establishment	6,000	6,000 × 6	36,000
Equipment	23,726	23,726 × 6	142,356
Maintenance	3,558 per centre per year	3,558 × 6 × 4	85,392
Communication	0.00	0.00	0.00
Staffing	50,000 per year for all centres	50,000 × 4	200,000
Total cost over four years			**463,748**

Expenses prevented by telemedicine

Expense	Savings (A$)
Return travel cost for patient and one relative	670,760
Overnight accommodation for patient and one relative in Townsville	60,500
Urgent Aero Medical Retrieval of four patients	52,400
Specialist travel to remote centres	72,000
Total savings over four years	**855,660**

Poster Presentations (Sun, 25 Sep, 14:00–16:30)
Oncotechnology

2156 POSTER

Effectiveness of Infrared Microspectroscopy in the Differentiation of Benign Liver Nodules From Hepatocellular Carcinoma

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Background: The hepatocellular carcinoma (HCC) is the most common type of liver cancer, accounting for 90% of cases. The relationship between HCC and cirrhosis is well established, especially in secondary cases to infection by the B and C virus of hepatitis and consumption of alcoholic beverages. Liver nodules can be benign (regenerative or cirrhotic) or those (low-grade dysplastic and high-grade dysplastic) which may undergo transformation to HCC. Injuries to liver are defined consistently only by histological analysis. It is worth mentioning that the differential diagnosis of benign nodules and HCC is needed to define the appropriate therapy for each case. Also, early diagnosis of HCC confers a better prognosis to the patients. However, difficulties are commonly encountered in the differentiation of benign and malignant liver lesions (HCC) using conventional histological analysis, which justifies the search for other methods that contribute to correct diagnosis of different lesions.
Objective: The aim of this study was to investigate whether infrared microspectroscopy allows the differentiation of benign lesions in the liver and HCC, with the conventional histological analysis as the gold standard for such determination.
Methods: It was analyzed fragments of human liver, benign nodules or HCC, embedded in paraffin blocks of the archive of the Department of Pathology of our Institution. Histological sections of 5 μm in each case were mounted on glass slides. The fragments were analyzed in a Spotlight 400N spectrometer (Perkin Elmer, Seer Green, England). The parameters used were: image mode, 64 scans per pixel, resolution 4 cm^{-1}, spectral range of 2000 to 6000 cm^{-1}, area of 100×100 microns). The calculations were performed using the LS-SVM Toolbox for Matlab 7.8. For the development of the models, it was used 83 spectra of dysplastic or HCC nodules and 41 cirrhotic nodules. In the models that presented the most accurate classification of samples, the following pre-processing was used: second derivative, autoscale and normalization, to eliminate spectral differences caused by concentration and scattering of radiation between the samples, and orthogonal signal correction (OSC) to eliminate unnecessary information from the spectra. The support vector machines (SVM) are learning algorithms that can model data via adapted nonlinear kernel functions. It was used the SVM parameters optimization by genetic algorithm.
Results: 81% of samples were correctly classified, considering cirrhotic and HCC nodules but was not effective to differentiate cirrhotic from dysplastic nodules and dysplastic nodules from HCC.
Conclusions: The results suggest that infrared microspectroscopy is an effective method to differentiate benign lesions of liver and HCC and thus may contribute to establishing the differential diagnosis in daily practice of oncology services and clinical pathology.

2157 POSTER

Diffuse Reflectance Spectroscopy − a New Guidance Tool for Improvement of Minimal Invasive Procedures in Lung and Liver Cancer

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Background: During diffuse reflectance spectroscopy (DRS), tissue is illuminated by a broadband white light. Subsequent alterations in the light spectrum occur due to scattering and absorption. Specific quantitative biochemical and morphological information from the examined tissue can be derived from spectral changes and provide information on cellular metabolic rate, vascularity, intra-vascular oxygenation and alterations in tissue morphology. Thus, DRS allows to make a distinction between tissues by differences on a molecular and morphological level and has the potential to be incorporated into optical tools for cancer diagnosis and therapy. We hypothesize that DRS has the ability to enhance diagnostic accuracy and to refine minimal invasive treatment of malignant lung and liver disease by improving localisation possibilities.
Methods: *Ex-vivo* analysis with a DRS system was performed on lung tissue from 10 patients and liver tissue from 14 patients. A total of 330 optical measurements were performed on 67 tissue locations of both normal and malignant lung tissue. A total of 526 optical measurements were performed on 101 tissue locations of both normal and malignant liver tissue. Tissue spectra measured from 500 to 1600 nm were analyzed and classified using a model-based analysis. Results were compared to the histological diagnosis of the measured tissue.
Results: DRS spectra yielded sensitivity and specificity figures of respectively 89 and 79% for the discrimination of normal lung tissue from malignant lung tissue. The resulting overall accuracy was 84%.
For liver tissue, sensitivity was 96% and specificity was 91%. Overall accuracy for discriminating normal liver tissue from malignant liver disease was 94%. This discriminative power was enhanced in liver tissue as compared to lung tissue due to the significant difference in bile concentration which can be measured with DRS in normal liver parenchyma compared to the malignant lesions.
Conclusion: DRS demonstrated a high accuracy for discriminating between normal tissue and malignant tissue of *ex-vivo* human lung and liver tissue. Based on presented results we conclude that DRS has the potential to enhance accuracy of minimal invasive procedures of both organs in clinical practice. A feasibility study in the clinical setting has been initiated.