

The use of bedside ultrasound and community-based paracentesis in a palliative care service

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ABSTRACT

INTRODUCTION: There is little information, particularly in New Zealand, on the use of ultrasound to enhance clinical decision-making in a specialist palliative care service. Technological advances have resulted in increasingly portable, user-friendly ultrasound machines that can be used in the home setting to offer convenient access to this treatment option.

AIM: To evaluate the clinical use of portable ultrasonography in the management of abdominal ascites in a community palliative care service.

METHODS: Patients referred to the Nurse Maude Hospice and Palliative Care Service requiring assessment for abdominal ascites over 12 months were scanned using a newly purchased handheld ultrasound machine. The patients had a variety of diagnoses; the most common diagnosis was ovarian cancer.

RESULTS: Forty-one ultrasound scans performed for 32 patients to assess for ascites drainage were recorded. Fluid was identified in 19 assessments and drainage undertaken in 17. Over half the scans were completed at home, allowing nine procedures to be performed safely and conveniently, which reduced time spent at the local hospital. There were no major complications.

DISCUSSION: Ultrasonography is a tool that has not previously been utilised in palliative care locally, but has significant potential patient benefits. This novel use of technology also highlighted potential cost savings to the patient and health system, which may be beneficial to other palliative care services in New Zealand.

KEYWORDS: Ascites; community health services; palliative care; paracentesis, ultrasonography

Introduction

People with advanced disease frequently suffer from multiple symptoms at the end of life.¹ They may be required to present repeatedly to tertiary or secondary settings for review, investigation and procedures, including treatment for ascites. This can become very taxing and a burden on their time and energy. Palliative care focuses on quality of life and meaning for patients with a life-limiting illness.²

In New Zealand, specialist services provide support, treatment and advice for primary care providers dealing with complex palliative care cases, mainly in the community and sometimes in inpatient settings.³ Nurse Maude Hospice and Palliative Care Service is a community-based,

charitable organisation, providing specialist community palliative care to patients in Christchurch and the Canterbury region. Annually, the organisation receives over 1500 referrals and provides over 100 000 hours of palliative care services to patients. It also admits approximately 320 patients to the Nurse Maude Hospice each year.⁴ Services tailored to providing care close to home are constantly evolving within current international health systems and are seen as a benefit for all.⁵

Management of ascites in the community setting

A challenge faced by those providing palliative care in the community includes the symptomatic management of abdominal ascites, which has usually required hospitalisation for both investi-

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gation and treatment. Malignant ascites is related to fluid build-up as a consequence of cancer and is most commonly associated with tumours of the breast, lung, ovary, stomach, pancreas and colon. As this fluid accumulates, it causes increased abdominal pressure, often with pain, shortness of breath, nausea, loss of appetite, swollen legs, reduced mobility and problems of body image.⁶ Paracentesis is the drainage of ascitic fluid from the abdomen via cannulation and provides relief in approximately 90% of cases.⁷

Clinical ultrasonography is used to assess the need for invasive procedures and to allow safer decision-making. Technological advances have resulted in increasingly portable, user-friendly ultrasound machines, with improved image quality and affordability, enabling clinician-performed ultrasonography.⁶

Literature available on the use of bedside ultrasound in palliative care suggests it is a safe and convenient option.^{6,8} In October 2010, the Nurse Maude Hospice and Palliative Care Service purchased a Signos Personal hand-held ultrasound machine with a 3.5-MHz probe (Signostics, South Australia, Australia) for NZ\$5,000, for the purpose of improving care in the hospice setting and in the community. In order to monitor the effectiveness of the ultrasound for quality assurance purposes, information on its use was kept in a database by clinicians. This information included patient demographics, date of treatment, setting diagnosis, indications for use of the ultrasound, findings, volume drained and outcomes. This paper outlines the experience of introducing portable ultrasound into a community-based palliative care service over the first 12 months.

Methods

Prior to the introduction of the ultrasound device, one of the specialist palliative care physicians and the palliative care registrar undertook training in ultrasonography. Therefore, two operators used the ultrasound machine for the 12 months between October 2010 and October 2011, with development of a local guideline to ensure consistency. This guideline was developed looking at current literature and best practice reviews on the use of ultrasonography for abdominal

WHAT GAP THIS FILLS

What we already know: Paracentesis is a procedure used in malignant ascites for palliation of some symptoms. It is mainly performed in the hospital setting. Ultrasound guidance is used more frequently for placement of the drains. More portable options now exist, which may be of use in the community.

What this study adds: The use of a hand-held ultrasound machine was utilised by the Nurse Maude Hospice and Palliative Care Service for patients with ascites to determine the need for paracentesis and also to place the drains safely. This included in the home environment, suggesting primary care could consider offering this service.

ascites. Information on the patients was entered into a database prospectively and then the charts of all the patients were retrospectively reviewed to complete the database and check outcomes. Ethical approval was given by the New Zealand Lower South Health and Disability Ethics Committee to use the data in this study.

Review for abdominal ascites with a view to drainage was usually suggested by general practitioners, district nurses or the palliative care clinical nurse specialists. Each patient had a history taken and a physical examination prior to their ultrasound scan. Level of pain and shortness of breath were the most important symptoms in offering the paracentesis. If fluid was present and it was deemed appropriate, the procedure was explained and a consent form signed. The drains were placed by the doctor and left to be monitored by the family. The district nurse visited four to six hours later to remove the drains and check the patient's status.

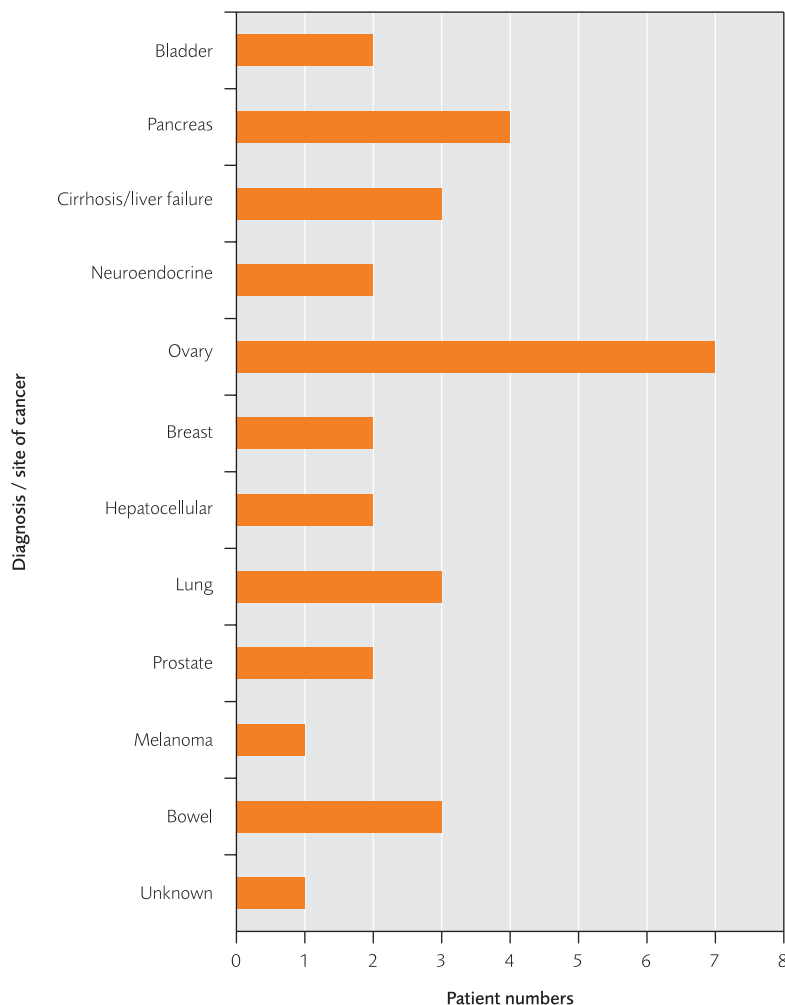
Results

Forty-one scans were performed on 32 patients for ascites drainage. Multiple assessments occurred in seven patients, one having four scans. All of the patients were under the care of the Nurse Maude Specialist Hospice and Palliative Care Service.

Diagnosis of patients requiring ultrasound

The patients requiring ultrasound scans had varying diagnoses (Figure 1). All but three patients

Figure 1. Diagnosis of patients having ultrasound scans for ascites



had a malignancy, with ovarian (seven patients) and pancreatic (four patients) cancers being the most common.

Location of patient having ultrasound and drainage

Of the 41 scans performed for 32 patients, fluid was present in 19 cases. Drains were placed as outlined in the methods section in 17 of these 19 cases. In one patient, the ultrasound showed loculated fluid and paracentesis was performed. No fluid drained. In another patient, fluid was seen on the ultrasound scan but the patient requested hospital review prior to any drainage. Ascites was not seen in 22 of the scans and this often

prompted discussion about the disease progression with the patient and family.

A total of 25 ultrasounds (25/41; 61%) were completed at home and nine of these patients went on to have paracentesis. In the hospice, 10 (10/41; 24%) of the ultrasound scans demonstrated fluid resulting in five ascites drains. Of the five (5/41; 12%) scans completed for patients in residential care, three showed fluid on the scan and had drainage performed. One of the remaining cases drained was seen in an undocumented location and the other in the Nurse Maude Hospice outpatient clinic. There were no major complications, although one procedure did not obtain any fluid as discussed previously and it was abandoned. The amount of fluid drained ranged from 400 mL to 5 L.

The clinical notes reported relief of symptoms in eight patients of the 17 who received ascites drainage. This may under-represent the benefit because of suboptimal documentation. In the other 11 patients, it was not documented whether or not the drain was beneficial.

Discussion

This report illustrates the potential usefulness of bedside ultrasound prior to paracentesis in the community setting. It also provides a foundation for other primary care teams considering offering this service. Ultrasonography does require training to become proficient enough to be of use. One of the operators in this study undertook a one-day course directed at general practitioners and non-radiology specialists.

Multiple patients benefited from the scans being done in a convenient manner, with less disruption to the patient and family. It could also be argued that simple paracentesis does not require imaging, but it does allow the practitioner to have more confidence in proceeding. However, Patel et al.⁹ evaluated the complications associated with paracentesis, comparing the use of ultrasound with blind procedures. They found significantly less adverse events, such as post-drainage infection and haematoma, in the ultrasound group. In situations where fluid was not present, a conversation about prognosis and disease progression was sometimes facilitated and

a procedure avoided. Families could visually see the screen and understand the decision-making.

The use of bedside scanning saves time, and reduces patient and carer burden. The ultrasound may also have other uses not yet explored, particularly as the operators become more advanced and experienced. Imaging complements good history taking and physical examination.

This paper has several limitations. The number of patients included in the study is relatively small and the data from patient charts collected retrospectively. The documentation was somewhat poor, particularly with regard to benefit of paracentesis to the patient. It could also under-represent the complication rate, although these are more likely to be documented by health professionals. It is also the experience of one centre and two operators. It did not include patient feedback. However, it highlights the novel use of technology already in existence to offer services in the home and wider community.

Within our service, it has now become an established practice for ultrasound prior to paracentesis, with plans to expand the number of operators. This will ensure its ongoing use, increase its availability and, potentially, patient benefit.

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COMPETING INTERESTS

None declared.