

Teleconsultations in Pohnpei State, Federated States of Micronesia

JOHNNY S. HEDSON*

Abstract

A case report of 6 years old female who sustained a difficult right subtrochanteric fracture of the femur is outlined. She was treated successfully, with local materials, over the internet with assistance of the orthopaedic surgeons at the Tripler Army Medical Center in Honolulu. Pohnpei State spends 10% of the health budget in referring patients off-island for tertiary treatments and this serves less than 1% of the total population. Before the use of the internet, approximately \$US1,500 per month was spend on telephone bills, for outside consultations. After connection to the internet and the consult webpage, particularly at Tripler, this cost was reduced to below \$US500 per month. To date, fifty consults, via the Internet, have been sent to the TAMC Consult Webpage. The introduction of this service has resulted in cost saving in terms of referral communication and perhaps avoided unnecessary off island evacuations. The difficulties so far have been limitation of on-line access and computer illiteracy amongst physicians.

Introduction

The case is first presented and will be followed by background information and discussion.

Case presentation

A 6-years old Micronesian girl who was admitted to the Pohnpei State Hospital on the 25th of August, 1998, with a difficult right femoral subtrochanteric Type II (Fielding's Classification) fracture (see Figure 1).

A consult was sent to the Tripler Army Medical Center (TAMC) Consult Webpage on the 30th of August, 1998 after the initial pin traction was done, and photos were taken (see Figures 2, 3, and 4).

Comments from TAMC

From: *Donald A. Person. Medical Director of Pacific HealthCare Program, Hawaii*

Date: 09/01/98

Comments:

Forwarded case to Gregg Taylor

From: *Donald A. Person. Hawaii*

Date: 09/01/98

Comments:

Forwarded case to William Burkhalter

From: *William Burkhalter. Orthopedist, Hawaii*

Date: 09/02/98

Comments:

The photograph notes excellent initial treatment; it is unclear to me what is under the heel of the leg in traction- I would recommend that it is free so that a decubitus may be avoided. The radiographs in traction are a little difficult to discern, but it appears the fracture is in extension and underdistracted. I would recommend beginning with about 1/6th of the body weight for the traction pin and follow x-ray with cross table lateral and AP of the femur, not pelvis. Also, the position with 90 degrees hip flexion is good; I would worry little of the abduction and add slight external rotation.

From: *Johnny Hedson. Staff Physician, Pohnpei, FSM*

Date: 09/04/98

Comments:

Thank you very much Dr. Burkhalter for your excellent comments. The heel is resting on the support, but I will certainly create a hole to free the heel. The weight on traction is currently at 2 kg or 4.4 lbs, and as you have suggested, I will increase the weight to 1/6th body weight. One big problem I have here is that our portable Xray machine is not functioning well, and thus the portable films are certainly of poor quality. I will certainly correct the abduction as well. Thank you very much for your valuable comments.

I have noted from literatures about the difficulties in reducing this type of fracture by external means, and that

*General Surgeon, Pohnpei State Hospital, FM 96 941, Federated States of Micronesia. Ph: +691 320 2212/2214; Fax: +691 320 5394; Email: psm@mail.fm

Fig. 1. Pre-reduction. PA View



Fig. 2. Photo of whole girl in traction



Fig. 3. Immediate Post-Reduction (PA View)



Fig. 4. Immediate Post-Reduction (Lateral view)



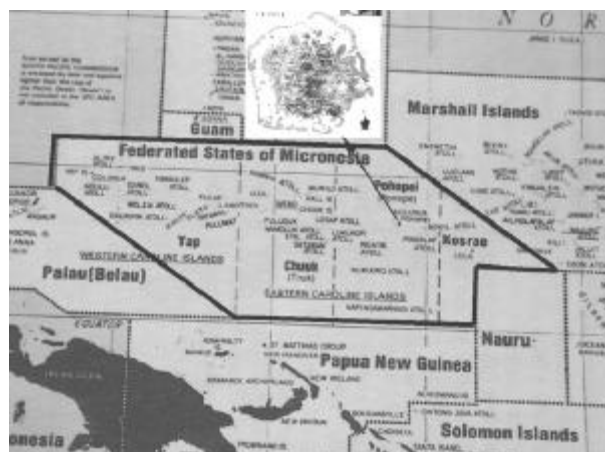
Fig. 5. Six Weeks post-reduction (PA View)



Fig. 6. Six weeks Post-Reduction (Lateral View)



Fig. 7. Map of Micronesia



even with ORIF, no device have been made for this type of fracture.

Again, thank you very much.

Aloha.

From: **Donald A. Person. Hawaii**

Date: 09/04/98

Comments:

Dear Johnny, This is the way I hope we can exploit our electronic interactions! What a great case and excellent supporting images! You are to be complimented too! Best, Don Person

From: **Johnny Hedson. Pohnpei**

Date: 09/06/98

Comments:

Thank you very much Col. Person for those kind words. After correction of the position, the young girl is almost asymptomatic now. Thanks so much...

With the expert assistance of the Tripler Army Medical Center Orthopedic surgeons, manipulations were done with local materials, and the fracture healed satisfactorily (See all related photos).

Background information

Pohnpei State, like any other Pacific Island, is isolated from the convenience of a tertiary care facility. A population of approximately 40,000 people with an annual growth rate (AGR) of 2–3% along with a high birth rate demands a high quantity and quality of care and resources within the health care facility. Approximately 10% of the total annual health budget was spent on referrals serving less than 1% of the total population.

The methods of communication are insufficient, and many times inefficient, regarding quality patients' care. The high cost of communication via the telephone, and live-video conferencing renders these facilities unaffordable in a dwindling financial resources in the Pohnpei State.

A vast amount of ocean separates Pohnpei State from nearby tertiary care (see Map in Figure 7). The costs of commercial airlines, let alone any med-evacuation system (if it became available) is obviously not within the scope of the annual health budget, for off-island tertiary care.

With the introduction of communication and information technologies to the Pohnpei State in the mid-1990's, and

introduction of the user-friendly e-mail services and webpages, teleconsultation with tertiary level care became quite feasible and affordable in this part of the world. Training of health providers in computer technologies become essential in order to deliver quality health care at home and abroad. Attempts have been made to train all Pohnpei State physicians to become comfortable in consulting specialists in any fields, at any tertiary care level using the e-mail services, by means of store and forwarding images.

Teleconsultation parameters in Pohnpei State

The closest tertiary care facility to the Pohnpei State is Guam, which is approximately 1,500 miles away, and takes two and half hours to reach on the scheduled commercial airlines. Currently, there is no set up medevacuation system for tertiary care emergencies. It takes 24–36 hours to medevac a critical medical case on a scheduled commercial airline flight.

The cost of telephone to Guam and Hawaii is \$US 10.00 per 3 minutes, and \$US 12.00 per 3 minutes to the Philippines to consult specialists. Usually it may take more than 10 minutes, and sometimes never, to get hold of a busy specialist abroad on a telephone line. However, with the current internet connectivity, it is roughly \$US 50.00/month for the whole tele-consultation and e-mail services, and there is evidence that some unnecessary referrals had been avoided. Pohnpei State health services spent approximately \$US 1,500 per month for phone services, including consultations per phone, however with the inception of the internet connectivity, the monthly bill had gone below \$US 500 per month.

Per FSM Compact Agreement with the US Government, the US Military is to provide assistance in tertiary care for patients referred off-island from the FSM, and thus Pohnpei State. US Senator Inoue from the State of Hawaii had been very instrumental in asking for federal grants to assist in this regard, particularly to the Tripler Army Medical Center, which kindly accepts teaching medical-surgical cases from the US-Associated Pacific Islands to support graduate medical education at TAMC.

Two types of the tele-consultation processes are currently available in the Micronesian islands, the video-conferencing and the store and forward image. It is roughly \$US 100,000 to set up the video-conferencing process with additional

Fig. 8. Teleconsultation store and forward image set-up



Fig. 9. Consults sent to TAMC Consult Webpage from Pohnpei State

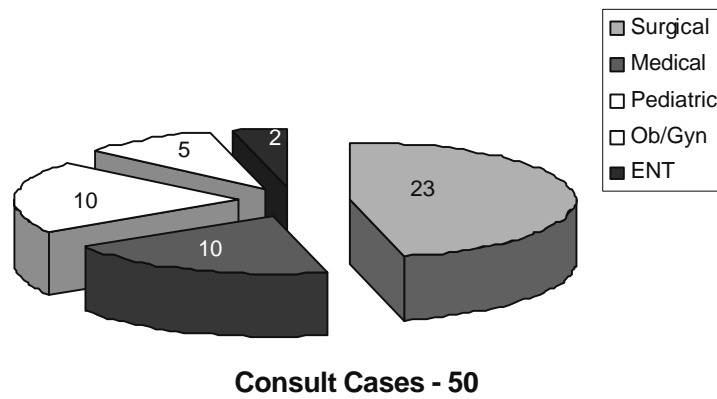


Fig. 10. Outcome of Consults sent to TAMC from Pohnpei State

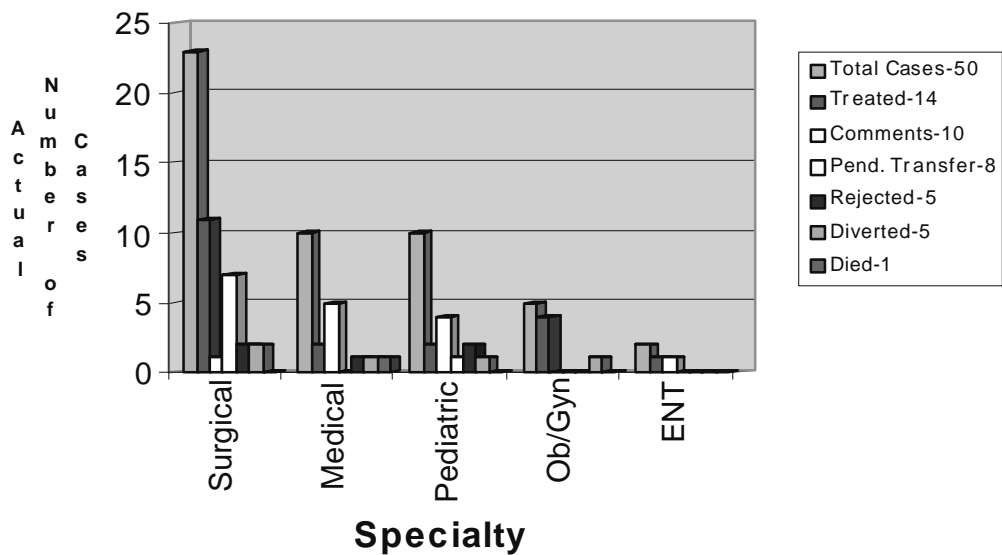
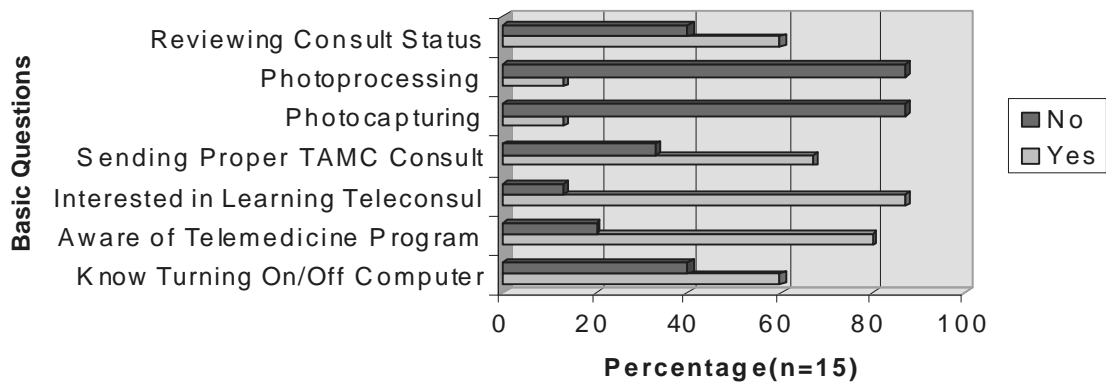


Fig. 11. Computer literacy amongst physicians



costs on the real-time conferencing, while it costs just under \$US 10,000 to set up the store and forward image process (Figure 8). With an Memorandum of Understanding between the Pacific Basin Medical Association (PBMA) and the Akamai Project in Hawaii, some computers were given by Project Akamai for a trial of teleconsultation process in a selected number of islands in Micronesia.

From the end of January, 1998 till end of October, 1998, fifty (50) medical and surgical consults were sent to the Tripler Army Medical Center via their consult webpage in Honolulu, Hawaii from the Pohnpei State. Of these 23 cases were surgical in nature, 9 were medical cases, 10 cases were pediatric, 5 cases were gynecological, and 2 were ENT cases, as shown per figure 9.

Figure 10 shows the outcome of each of these consults sent. Out of the 50 cases sent, 46% were surgical cases, with equal percentage (20%) between medical and pediatric cases, and few from Ob/Gyn and ENT services. Fourteen cases so far had been sent and treated at TAMC. Comments were made on 10 cases on how to manage these cases locally. Five cases were rejected for transfer (when requested) due to the nature of the illnesses, and less medical teaching benefits thereof. Five cases were diverted to the Philippines for tertiary care, which were mainly patients who were insured, and awaiting the referral process. Eight of the cases approved for referral are still pending the completion of the referral process. One case while waiting to be referred died secondary to suspected severe leptospirosis.

The response time for specialist comments on these consults have been between one to seven days, and 2 weeks to 3 months before a final decision is made on a case.

A number of Pohnpei State physicians responded to a small survey about the concept of telemedicine and teleconsultation (Figure 11). Out of the 15 physicians responded (total of 19 physicians in Pohnpei Health Services), 60% still do not know how to turn on or off a computer properly. Though 80% are aware of a teleconsultation program, more than 80% have yet to learn the process. Most (> 60%) have learnt how to send a consult properly to TAMC, but more than 80% have yet to learn how to take and properly process clinical photos, i.e. x-rays, patients, EKG, etc.

We have experienced only few problems so far with this store and forward teleconsultation. Mainly, it has been the illiteracy of physicians with the system, despite the fact that the first round of training had been done, after the system was put to work. Attempts are being made to resolve this problem. Another problem that is becoming inherent is the fact that the more physicians learning the process, there will be a greater need to expand the scope of this teleconsultation process, in terms of more computers, and more on-line time. We are still exploring more on how to accommodate medical emergency evacuations using this system.

Discussion and conclusions

Since the introduction of the information and communication technologies to Pohnpei State and recently the TAMC Consult WebPage, it has proven to be extremely beneficial for care of patients at the local level, as well as referrals off-island. Teleconsultation using the internet had certainly reduced the cost of communications in terms of overseas consultations with specialists, and avoidance of unnecessary referrals. It is a technology that requires some degree of learning, as a short survey showed that only a few percentage of local physicians are able to use the technology comfortably. The store and forward technology has shown to be quite feasible and affordable to the local situation, but certainly demands a more closer look at how to incorporate the management of critical medical emergencies into the system. Perhaps the addition of more medical and surgical specialists pool around the Pacific Rim and/or abroad would certainly improve on the situation.

References

1. Yano V, Finau S, Dever G, et al. The PBMA and Telemedicine in the Pacific: the first steps. *Pacific Health Dialog*, 1997; 4(1):81-84.
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Technology ... the knack of arranging the world so
that we need not experience it.

Max Frisch. *Homo Faber*, 1957