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The use of anatomical models in an Orthopaedic clinic aids in patient education

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Abstract

Background: One of the World Health Organisation strategies to achieve patient centered care is for patients to be able to effectively give informed consent. Well-informed patients are also likely to be more compliant and have better treatment outcomes. **Aims and Objectives:** Our study looks at using anatomical models as adjuncts in consultations to determine if they would be useful in improving patient understanding and satisfaction. **Study Design/Methods:** A survey of patients was carried out at a single Orthopaedic foot and ankle clinic in Singapore, to investigate if patients felt that the use of anatomical models aided in their understanding of their medical condition, foot and ankle anatomy, and surgical procedures offered, if any. 2 different anatomical models were used, depending on the context of the consultation. All conditions encountered were included. Institutional Review Board approval was not required for this study. **Results:** 30 patients were surveyed in total, all of whom agreed that the models were useful in helping them understand their medical condition and foot and ankle anatomy better. Of the 19 patients who were counselled regarding surgery, 18 felt that the models improved their understanding of the proposed procedures. 26 patients would like similar models to be used in other Orthopaedic clinics, although 3 would not, and 1 was not sure. On the whole, 19 patients found the models very useful, and 11 patients found them useful. **Conclusion:** Anatomical models are a cost-effective method of contributing to patient education compared to other alternatives, and we would advocate the use of models in other Orthopaedic clinics during consultations for counselling and taking informed consent.

Keywords: Model, Foot and ankle, Patient education.

INTRODUCTION

In 2016, the World Health Organisation (WHO) released a framework on developing integrated, people-centred health services. One of the five strategies set out to achieve this focuses on “empowering and engaging people and communities”, to allow individuals to make effective healthcare decisions on their own through informed consent ^[1].

Both American and British guidelines have highlighted the use of visual aids as adjuncts in discussions with patients regarding their health conditions ^[2]. This could take the form of anatomical models, patient leaflets, or videos and other multimedia tools. Although there is currently no consensus on a standardised means of assessing patients’ understanding, studies have shown that patients’ understanding of surgical treatment is poor ^[3]. Legal considerations with regards to informed consent aside, well informed patients are more likely to be compliant with healthcare recommendations, and there have been demonstrated improvements in outcomes in patients who were provided with preoperative education compared to those who were not ^[4,5].

Our study looks at using anatomical models as a discussion aid in an orthopaedic foot and ankle clinic as a cost-effective method of providing personalised consultations to patients, with an aim to determine if they would be useful in improving patient understanding and satisfaction.

METHODS

Inclusion

The study was carried out in an Orthopaedic foot and ankle clinic at a single centre in Singapore. Patients selected were on their first or second clinic visit. All foot and ankle conditions encountered were included in the study.

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Ethics

Institutional Review Board (IRB) deemed after review that there was no need to obtain approval for the study. Patients were approached during their follow up visits for inclusion in the study, and surveys handed out to consenting participants.

Materials

We utilised two anatomical models of the foot. One model provided a representation of the foot bones, as well as selected examples of plates and screws commonly used (Figure 1). The second model shows the bones and ligaments of a foot and ankle (Figure 2). Either model was used in consultations, depending on the presenting foot and ankle condition.



Figure 1: Model of right foot bones with plates and screws



Figure 2: Model of right foot and ankle bones with ligamentous attachments

Survey

We developed a survey to assess patients' opinions on the usefulness of having anatomical models as a discussion aid in the outpatient setting (Appendix A). Brief information on each patient's profile was also collected, including age, sex, occupation, and highest education level. A series of questions then assessed how useful patients found the use of an anatomical model in helping them understand their medical condition, foot and ankle anatomy, and their upcoming surgery, if applicable. We also asked if patients would like for models to be used in consultations for other conditions in clinic. A free text section was included to allow patients to give any further feedback not included in the scope of the questions.

RESULTS

A total of 30 patients were surveyed, consisting of 16 female and 14 male patients, with an age range of 19 to 75 years.

All patients surveyed felt that the use of anatomical models in clinic helped improve their understanding of their medical condition, and of foot and ankle anatomy. Of the 30 patients surveyed, 19 were also counselled with regard to surgery. 18 (95%) of these patients also responded that the models helped them better understand the surgery that they would be undergoing. 1 patient (5%) did not feel there was any additional benefit in using anatomical models in understanding their surgery.

87% (26 patients) of patients surveyed would like to see similar models used in consultation in other Orthopaedic clinics, however 10% (3 patients) would not. 1 patient (3%) was not sure if models should be used in other clinics. On the whole, 63% (19 patients) of respondents found the use of models very useful, 37% (11 patients) found them useful, and none felt that the models were of no benefit.

DISCUSSION

Anatomical models are a valuable adjunct that can be easily incorporated into clinic consultations, and which help significantly increase patient satisfaction rates. Our findings showed that on the whole, patients felt that the inclusion of anatomical models in the clinic consultation was useful in improving their understanding of their own medical condition and the surgery for which they are planned. Multiple patients reported that the use of the model "helps in visualisation", and "shows how the ankle works and exactly which part is injured". This is in keeping with previous research showing improvement in patient understanding with the use of models or other visual aids [2]. There also appears to be no difference in efficacy of anatomical models in improving patient understanding across different education levels or age groups.

Other educational methods can also be considered to aid in improving patients' understanding, however each option has its own limitations. Leaflets are another commonly used adjunct in the outpatient setting. However, a patient-friendly, well-designed leaflet may be difficult to achieve, considering there is frequently insufficient information in its contents for informed consent, and may be difficult to read. Some studies have reported improved recall of information when leaflets were handed out, although on the whole, recall of information is poor, and there is minimal objective evidence to show that they have contributed significantly to patients' comprehension [3]. Furthermore, leaflets may be of varying efficacy across differing education levels. There is limited objective evidence showing that leaflets provide any significant contribution to patients' understanding [3].

Multimedia tools are other alternatives that have shown improvement in patient comprehension. These include interactive computer programs, videos, or animations. However, these are costly and time consuming to produce [3]. They are also less easily tailored to each patient's individual condition and needs, and are not always possible to incorporate in an outpatient setting [6].

Anatomical models, as ready-made options, are relatively cheaper compared to the alternatives. They are also easily adaptable to different consultation requirements, and therefore can effectively enhance consultations according to the unique needs of each patient [2]. This not only helps in overall patient understanding, but also improves patient satisfaction and by extension, the doctor-patient relationship [4].

Our study was conducted in a foot and ankle specialist outpatient clinic under a single consultant, ensuring there was standardisation of consultation and consenting styles between the different patients surveyed. However, a limitation is that there is no control group where similar consultations have been conducted without the use of models. Furthermore, while our study has conclusively shown that on the whole, patients appreciated the use of anatomical models as part of the consultation, the questionnaire we have used in this study is

unvalidated. However, there is no questionnaire that has been validated for this purpose [3].

CONCLUSION

The use of simple anatomical models is a cost-effective way of having a positive impact on clinical care. They are helpful in improving patients' overall understanding of their foot and ankle conditions, foot anatomy, and planned surgical procedures. The use of similar anatomical models would also likely be helpful when extended to consultations in other orthopaedic clinics. We advocate the use of anatomical models for counselling, taking informed consent, and consultation.

Conflicts of interests

The authors do not have any conflicts of interests to declare.

Authors' contributions

Beatrice Jun-Nian Tan – writing and editing of manuscript

Eric Hernandez Pagkaliwagan – editing of manuscript

Raj Kumar Socklingam - editing of manuscript

SBM Darshana Chandrakumara - editing of manuscript

Charles Kon Kam King - supervising and editing of manuscript, produced figures

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Appendix A

Use of Bone Model in Foot and Ankle Orthopaedic Clinic

Date: _____

Clinic Visit: First Second

Age: _____

Sex: Male Female

Occupation: _____

Highest education level: _____

Foot and Ankle condition under review: _____

Questions:

Did you feel that the use of models helped in the understanding of your medical condition?

Yes No

How useful was it?

Not useful Useful Very Useful

How did the models help you in understanding?

Did the models help in making you understand the anatomy of the foot and ankle better?

Yes No

Did the models help in understanding your surgery?

Yes No Not applicable

Would you like to see models used for other conditions in clinics?

Yes No

Any other comments:
