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RETROSPECTIVE ANALYSIS ON TYPES OF SUTURE MATERIALS USED IN NECK DISSECTION FOR PATIENTS UNDERGOING CANCER SURGERY IN PRIVATE DENTAL UNIVERSITY HOSPITAL

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Abstract

Selection of appropriate suture material is of immense importance in the matter of wound healing. By the term suture,the material by which two surfaces are kept in position. The time of removal of sutures , size and types of suture used , also determine the quality of healing. Especially the healing of surgery wounds of neck dissection in cancer patients. The aim of the study is to evaluate the type of suture materials used in neck dissection for cancer patients undergoing neck dissection. A retrospective study was carried out by reviewing, analysing the data of 86000 patient between June 2019 to March 2020, among which 32 patients were selected who reported to the Department of Oral surgery and oral oncology for neck dissection.The various suture materials preferred for wound closure were collected from the patient records and tabulated on a spreadsheet. The collected data was analysed by computer software SPSS version 21 using Chi square test with the level of significance with age,gender and most preferred suture material.The highest number of cancer patients were found under the age group of 50 years (37.84%) and was most prevalent among male patients(81.08%) .The extra oral suture materials used were ethilon (56.76%) , silk(40.54%) and nylon(2.70%) with the most commonly used suture material being ethilon due to its superior qualities.The suture material used had no significant association with age(p value-0.32) and gender(p value-0.649). The most preferred suture material was ethilon due to its superior qualities.

***KEY WORDS**: Cancer patients; ethilon; nylon; silk; suture materials*

Introduction

Fixed prosthodontic treatment deals with the replacement of teeth by artificial substitutes that are not readily removable from the mouth. Its focus is to restore function, esthetics and comfort[1]The fixed partial denture (FPD) is one of the most commonly preferred treatment options for a single missing tooth.[2] FPDs were considered to be the best treatment choice for replacing a single missing tooth[3] Fixed prosthodontics treatment can range from the restoration of a single tooth to rehabilitation [4]

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Wound closure is an important aspect of wound healing. A wound may be caused by violence, injection or deliberate traumatism like surgical incision. Accurate approximation of wound edges, maintenance of hemostasis and respectful tissue handling during an operation are necessary to help the healing process. Numerous factors play a role in wound healing. Suture materials are one of the important factors for wound healing[1] [2].

Suture materials are threads of natural, synthetic,metallic material to see a wound or incision together. The two most common types of suture materials are absorbable and nonabsorbable suture materials and multifilament or monofilament suture materials.

History of suture materials – Egyptian scrolls dating back to as early as 3500 BC described wound closure using suture materials[3] [4]. In past centuries, there have been many suture materials including animal tendons, horse hair, leather strips, vegetable fibres and human hair. In 1806, Philip syng physick a sturdy absorbable suture made of duck skin essentially inventing the modern techniques of suturing[5] [6] [7]. From time to time in surgical literature, there have been discussions of 'the ideal suture material'. For skin repair, the ideal material should be invented in the tissue to induce no foreign body reaction, have fine calibre and smooth surface and be strong and easy to handle. In addition it should provide a secure knotting characteristic and minimal trauma to the tissue.

Also, suture materials must have certain handling qualities to be effectively used[8] [9] [10]. Suture strength, injection risk, tissue, holding power, incision type and suturing technique are important factors for deciding type of suture for wound closure. The choice of suture for a particular procedure should be used on known physical and biological properties of suture, suture technique and healing properties of sutured tissue. However it all comes to the affordability and availability end of the day.

Some commonly used suture in neck dissection are ethilon, silk, nylon and prolene. The major goal of the suture material is to provide an adequate tension for wound closure without dead space but loose enough to obibate tissue ischemia and necrosis[11] [12] [13].The aim of the study is to evaluate the suture materials used in neck dissection in surgery patients of Saveetha Dental College.

MATERIALS AND METHOD

Study design

In this retrospective study, data from 86,000 patients records within Saveetha Dental College were retrieved and the data of cancer patients who underwent neck dissection were collected. At data extraction,all information was analysed and tabulated onto a spreadsheet. The study was commenced after approval from the Institutional Review Board. Cancer patients who were undergoing neck dissection were reviewed to check the reason and preference of selection.

Ethical clearance

The ethical clearance was(SDC/SIHEC/2020/DIASDATA/0619-0320) given by the institutional ethics committee,Saveetha Institute of medical and Technical science,Saveetha University.

Subjects and procedures

Data were analysed, reviewed and collected from a record of 86000 patients between June 2019 to March 2020, among which 32 patients who got surgical neck dissection. The following data were retrieved from the dental records: patient age, gender and usage.

Statistical Analysis

The data entry was done in MS excel sheet and data analysis was done in [IBM SPSS statistics]. The data was verified by saveetha ethics committee and by 2 examiners. The dependent variables were age and gender and independent variables were the patient's willingness, socio economic status.Chi-square test was used to compare the study subject with age, gender and usage.

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RESULTS

A total of 37 patients with a mean age of 1.28 years were included in the present study. Age was divided into three groups namely group 1(<50 years), group 2(51-60 years), group 3(>60 years). Figure 1 shows the distribution of cancer patients according to age, below 50 years there were 14 cancer patients(37.84%), between the age 51-60 years there were 12 cancer patients(32.43%) and above 60 years there were 11 patients(29.73%) with the highest number of cancer patients found under the age group of 50 years. Figure 2 shows the distribution of cancer patients according to gender, there were 30 male(81.08) cancer patients and 7 female cancer patients, with male patients being more when compared to female(Figure 2). Figure 3 shows distribution of suture materials according to usage, ethilon was 56.76%, silk was 40.54% and nylon was 2.70% with ethilon being the most used extra oral suture.

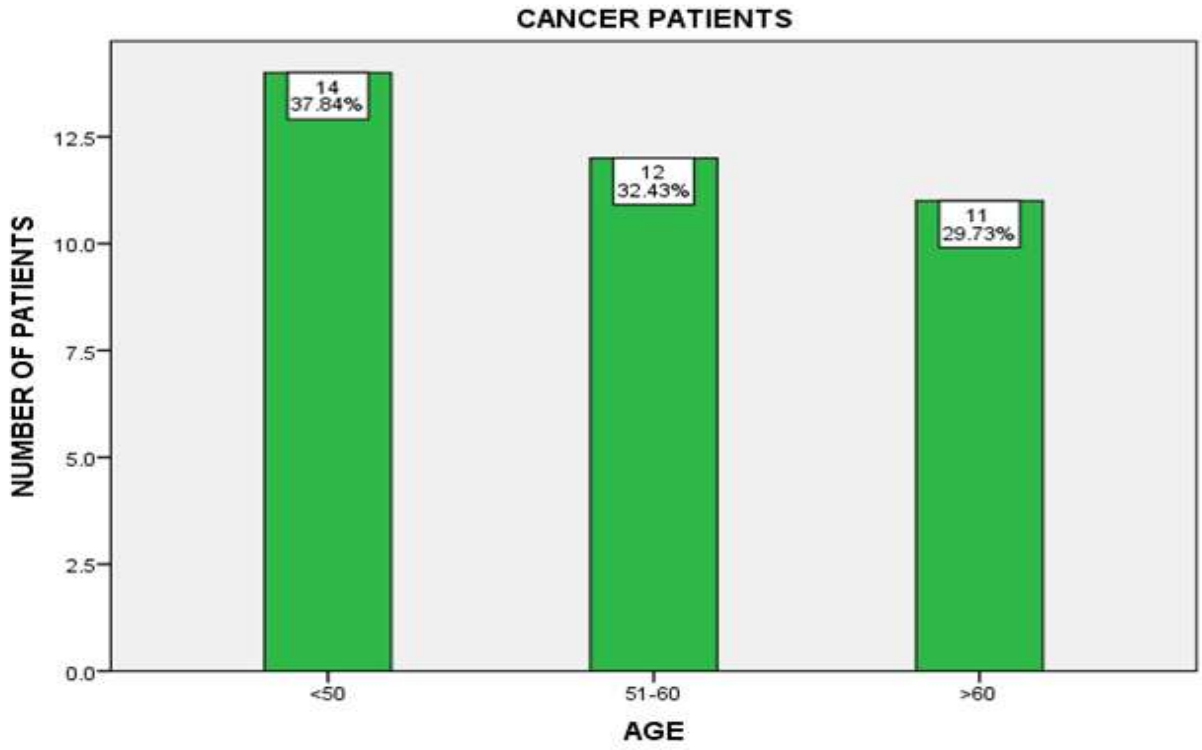

Figure 1 : Bar chart represents the distribution of cancer patients among different age groups. X-axis represents the age of patients and Y-axis represents frequency of cancer patients. From the above graph it is evident that patients with less than 50 years(37.84%) of age were more prone to cancer.

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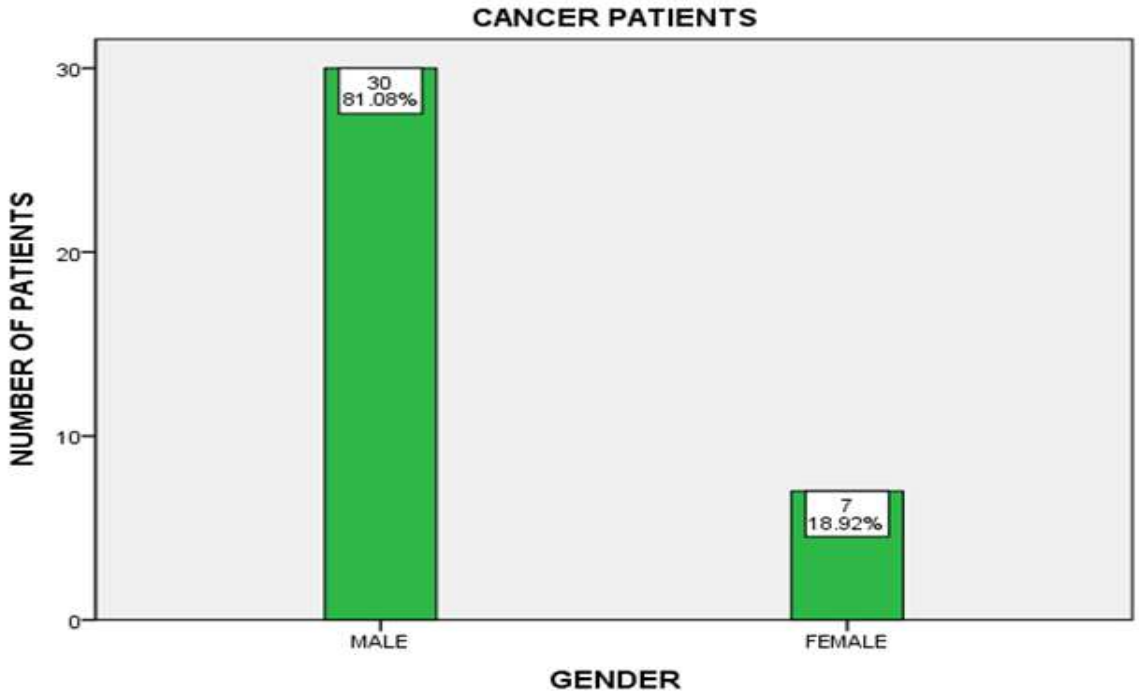

Figure 2 : Bar chart represents the distribution of cancer patients among gender. X-axis represents the gender of patients and Y-axis represents total number of cancer patients. Male patients (81.08%) were found to be higher when compared to female patients.

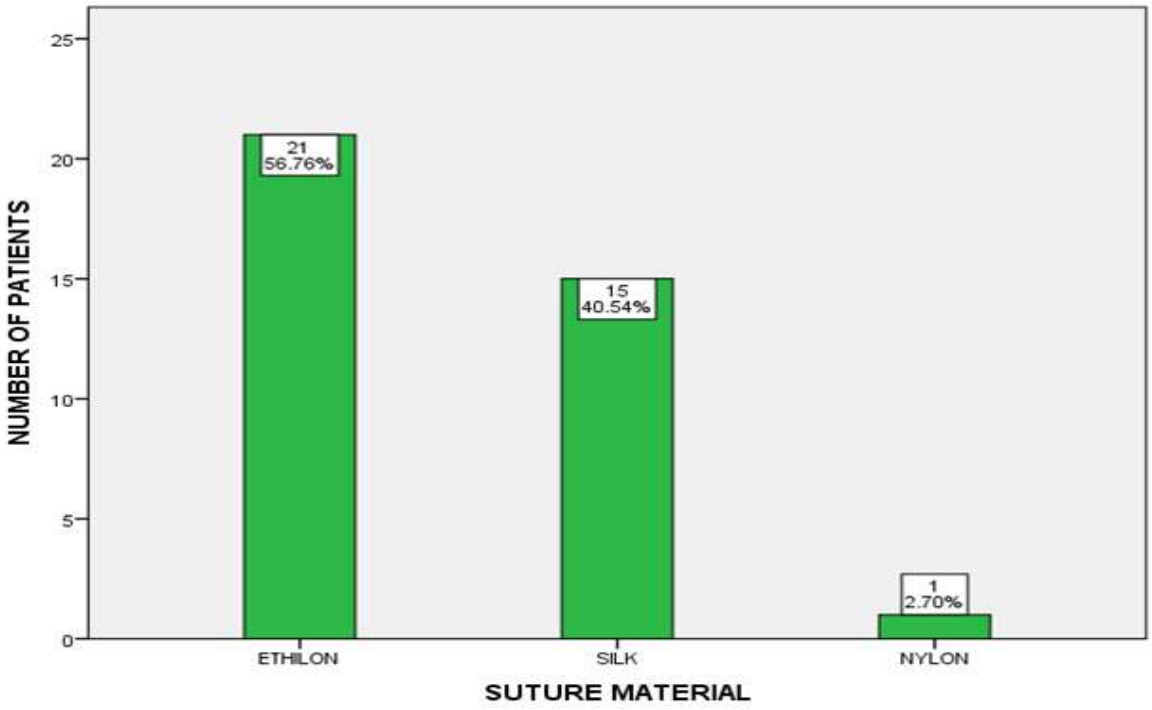

Figure 3 : Bar chart represents distribution of suture materials according to usage. X-axis represents different suture materials used in neck dissection and Y-axis represents the total number of cancer patients. It is evident that ethilon suture material(56.76%) has been used more when compared to the other suture materials.

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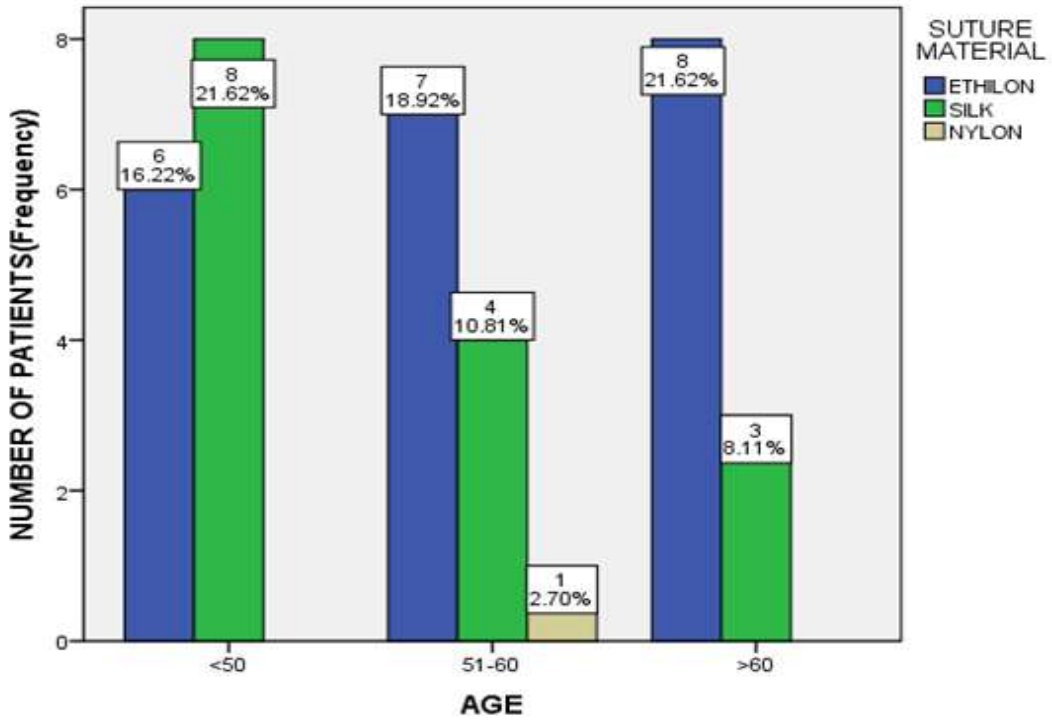

Figure 4 : Bar chart depicting association between age of patients with the suture material used. X axis represents age of patients and Y axis represents number of cancer patients.The association between age and use of suture material was found to be statistically not significant using Chi-Square test [p- 0.326 (p>0.05)]. Although it is statistically not significant, for those patients with the age group above 60, oral surgeons have commonly used ethilon suture material(21.62%) for neck dissection.

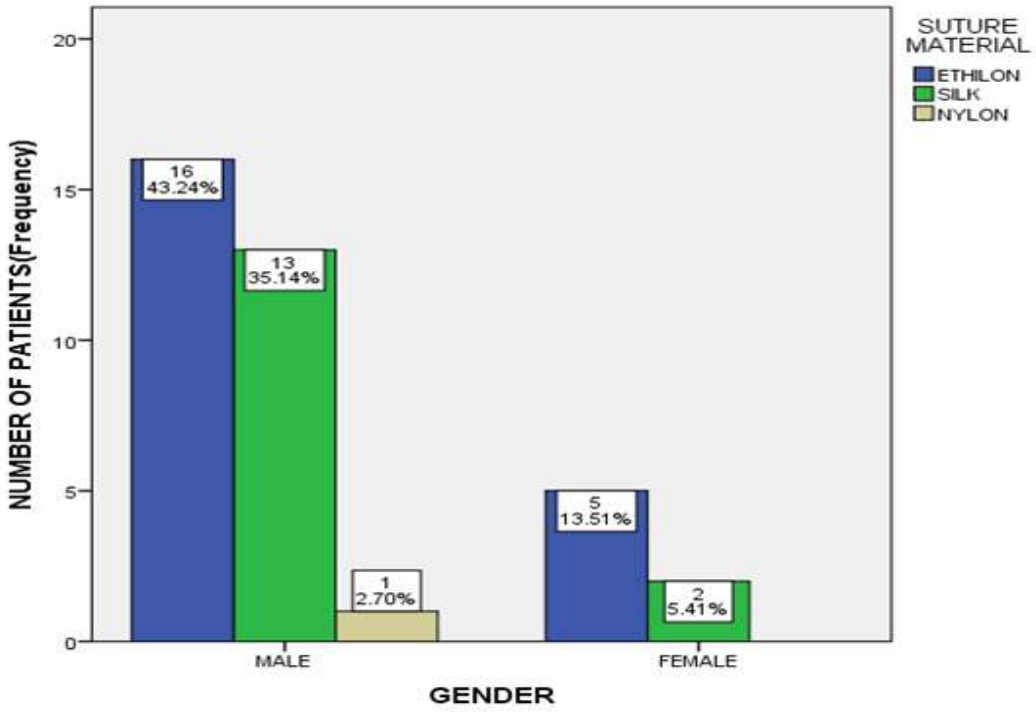

Figure 5 : Bar chart depicting association between gender of patients with the suture material used. X axis represents gender of patients and Y axis represents number of cancer patients. The association between age and use of suture material was found to be statistically not significant using Chi-Square test [p- 0.649 (p>0.05)].

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Although it is statistically not significant, Ethilon suture material (43.24%) was found to be more commonly used by the oral surgeons in both males and females.

Chi-square test was done between the suture material with age and gender to find the level of significance. Figure 4 shows the association of age of the patient and suture material used, under group 1(<50 years), ethilon was 16.22% and silk was 21.62%, under group 2(51-60 years),ethilon was 18.92%,silk was 10.81% and nylon was 2.70%, under group 3(>60 years), ethilon was 21.62% and silk was 8.11%. The Pearson's chi square value was p=0.326 hence it was statistically not significant. Figure 5 shows the association of age of the patient with suture material used, among the male patients , ethilon was 43.24%, silk was 35.14% and nylon was 2.70%. Among female patients, ethilon was 13.51% and silk was 5.41%. The Pearson's chi square value was p=0.649 hence it was statistically not significant.

DISCUSSION

The study results (figure 1) showed that there were the most number of cancer patients under the age group of above 40, the results of this study is similar to Hindle I et al which states that oral cancer remains primarily a disease of older patients; cases occurring in young adults are uncommon in the region of oral cancer in England and Wales[14] [15].

The study results (Figure 2) showed that female patients were more affected than male patients this is similar to the results of Akshat Malik.A et al which states that the number of male cancer patients has increased 2 folds as compared to the female patients. This shows that though the number of female patients has risen over years which is due to increased alcohol and tobacco consumption, still the problem remains much among males[16] [17] .Studies show that general characteristics of the patient such as age and gender and wounds's site seemed to be the two primary risk factors responsible for local wound complication[18] [19].

The most commonly used suture material i was ethilon according to the study results which is used because of its increased efficiency such as minimal inflammatory reaction slides well, easy removal and provides ideal running in intradermal stitches [20].

There are certain studies which say that oral tissue reacts to sutures and have revealed constant inflammatory reactions, which are more prominent with silk and cotton and minimal with nylon, polyester, EPTFE poliglecaprone 25 and PGA [21] [22]. But silk is still being used as it is the most cost effective and widely available suture material.

Over the years suture materials were overlooked by many other wound closure methods such as skin staples, adhesives[glues and adhesive tapes] to allow the surgeons to replace their tedious suturing technique which also results in better cosmetic appearance learning less scars[23] [24].A study by Jitender Batra et.al concluded that skin staples are better alternatives to conventional sutures in head and neck surgery as they offer 10 times faster wound closure, cost effectiveness, patient comfort, aesthetic outcome and complication rate[25] [26] [27].

CONCLUSION

To conclude our study male population had more oral cancer incidence than the female population and the increased incidence of oral cancer between 40 to 50 years. Although the association of age and gender with suture material used was not statistically significant, ethilon was used in majority of the patients in both male and females because of its superior properties. Ethilon was preferred due to its monofilament configuration which is less susceptible to bacterial invasion which was followed by silk and nylon in neck dissection. With the range of different skill and closure materials available today, choosing an ideal, rapid, safe and most practical and cost-effective materials is important. The major influence on selection of material was patient's affordability

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with ethilon being the ideal one. Furthermore studies are required on a larger scale population on different suture material usage and selection.

AUTHOR CONTRIBUTION

Author 1(J.Chandrapooja) carried out the retrospective study by collecting data and drafted manuscript performing the necessary statistical analysis. Author 2(Dr.Jagadish.V) aided in the conception of the topic, participated in the study design, statistical analysis and coordinated in developing the manuscript author 3(Dr.Ganesh Jeevanandhan) aided in coordinating and developing the manuscript. All the authors have contributed in developing the manuscript.

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CONFLICT OF INTEREST

There is no conflict of interest.

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