

A DISPOSABLE COMPLIANT-FORCEPS FOR HIV PATIENTS

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ABSTRACT

The objective of this project was to develop a disposable compliant forceps for HIV patients. Three-dimensional compliant forceps was modeled and analyzed using a commercial FE software i.e. I-DEAS (Integrated Design Engineering and Analysis Software). This forceps's handle was subjected to a load case from 5N to 25N, corresponding to loads applied to rigid-body forceps. Pseudo-Rigid-Body method was used as a methodology and the Finite Element Method (FEM) was used to validate this compliant mechanism. The suitable material for this disposable forceps had been chosen i.e. Polypropylene Co-Polymer.

Keywords: Compliant Mechanisms; Disposable Forceps.

INTRODUCTION

Human immunodeficiency virus (HIV) is the virus that associated with *AIDS (Acquired Immune Deficiency Syndrome)*. This retrovirus target CD4 cells in the body, eventually leading to their destruction. However, HIV infection is driven by viral replication rather than by immune system destruction [10]. Since the first case of HIV/AIDS was identified in 1986 in Malaysia, the number of infected individuals has increase steadily each year, so that, by the end of 2002, the cumulative number of people living with HIV/AIDS was 57,835 (51,256 with HIV and 6,579 with AIDS), with 5,676 AIDS deaths. [4].

The uncured disease, AIDS, has shocked the global especially in the medical world. It is not just made the scientists and doctors working-hard towards it antidote, but also to the engineers, who must design and develop a new disposable tools/products specially for them who are HIV-positive. It is very important to produce the disposable products because of the virus spread by sharing or re-used something that is exposed to this *human immunodeficiency virus*. So, it is important to dispose anything that has been used by the HIV patient. One of the devices that almost everyday exposed to this virus is a forceps.

Forceps is used everyday at the every hospital in this world. It becomes a very important tool either for open surgery or physical nursing. So, it is important to develop a disposable forceps that is easier to get rid compared to the conventional forceps. Besides that, it will reduce the productivity cost of the device.