Letter to Editor

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Google Cardboard and its Utility in Plastic Surgery

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Dear Sir,

The importance of medical photography was recognized early on by one of the pioneers of plastic surgery, Sir Harold Gillies claimed photography was one of the most important advances in plastic surgery [1].

Clinical photography is a permanent visual record and an essential tool in certain specialties like plastic surgery and dermatosurgery. Images are valuable for documentation, planning, providing visual references, assessment of outcomes, communication with the patient and relatives, sharing data and experience [2].

In a clinical armamentarium photography may be considered as an essential tool. Because of their increased utility various standards have been made for improvement of medical photography [3,4].

Smart phone cameras are used by many people as an adjunct to digital camera as image quality, zooming capability, pixels and screen size is improved in newer versions of smart phones

A good quality photograph taken by consultant can be shown to patients and relatives to discuss about wound/deformity/dermatological conditions and treatment planning. Pre operative and post operative comparison of outcomes can be done better with good quality photograph.

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Limitations of Existing Photography

In conventional available smart phones a 5 to 7 inches screen size is available but it may not be possible for discussing the medical conditions with patient/attendants due to unavailability of 3D effect (depth perception) of the condition.

Google cardboard is a simple and cost effective alternative to achieve 3 Dimensional pictures (Figure1, 2). It is important for better understanding of complex defects and making patient/relatives to understand (Figure 3). Recently available Google cardboard for smart phone costs only INR 289. It provides visualization of 3 D images from freely downloaded cardboard compatible software. It is an effective tool for discussion and planning with patient, relatives.

Google cardboard is a technology developed by Google which utilizes virtual reality platform, consists of a head mount with a slot for smart phone. The platform is a low cost system which consists of fold-out card board viewer. Cardboard viewer is made up of folded card board a pair of lens. Users can make their own design by using easily available contents. list of parts, schematics, and assembly instructions are freely available on their website. Pre manufactured viewer is also available in a ready to use device. The smart phone is kept in the slot provided in the back of the box and pictures/videos are seen from the front through the lenses. The platform was first made by David Coz and Damien Henry, Google engineers at the Google Cultural Institute in Paris. The viewer uses a Cardboard–compatible app which splits the smart phone display image into two, one for each eye. A stereoscopic 3

dimensional image is obtained by applying barrel distortion to each image to counter pincushion distortion from the lenses [5].

Three software development kits are available on Google for developing Cardboard applications. One for the Android operating system using Java, one for the game engine Unity using C#, and one for the iOS operating system [6]. Smart phone with screen size up to 6 inches can be used to see 3 D images in the viewer box.

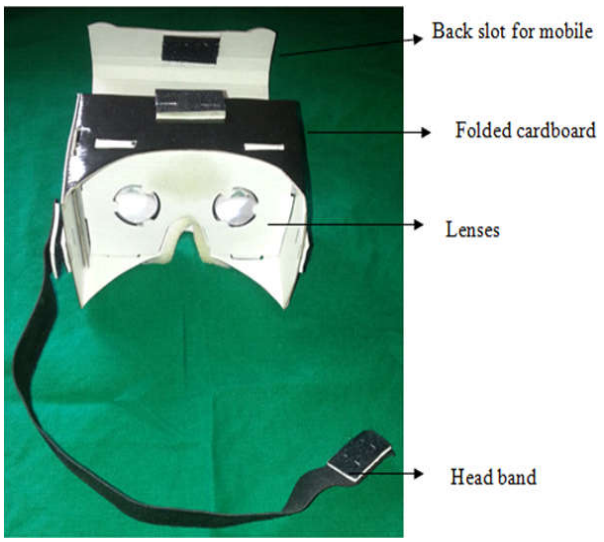

Fig. 1: Virtual Reality Cardboard Platform

Fig. 2: Virtual Reality Cardboard Platform with smart phone

Fig. 3: Patient's relative watching 3 dimensional picture of deformity for better understanding

Advantages of Google Cardboard

Cost effective

Light weight

Easy to assemble

Conclusion

Google cardboard is an effective and cost effective technique of three dimensional assessments of complex deformities and discussion with patient or relatives for better understanding of deformity, proposed surgery and outcomes.

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