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Mixed Reality on Robotic Assisted Partial Nephrectomy

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In the treatment of renal tumors, new technologies for surgical precision have been developed since 1960. This technological expansion occurred with the entry of aeronautical simulator technology into the field of medicine. Thus, new applications for Virtual Reality (VR) and Augmented Reality (AR) have been adopted in the operating room. In urology, VR and AR have been used both in surgical training and in operative planning for renal tumors.

In this way, there are many software that help us plan the surgery, and in some cases, we can also make use of devices that combine realities in order to work surgically with mixed reality; that is, virtual reality superimposed on surgical reality.

For Robotic Partial Nephrectomy (RAPN) cases in our group, Brainlab Elements surgical planning software (Brainlab AG, Munich, Germany) with planning for VR were used. A specific protocol for abdominal computed tomography angiography was developed, with the acquisition of a three-dimensional image, from 0.5mm slices, illustrating with precision both the parenchyma and renal tumor and the vascular tree and collecting system of the kidney tumor. In order to visualize it in the context of augmented 3D reality, the Magic Leap 1 device (Magic Leap Inc., Plantation, FL, USA) was also used, overlapping the realities.

In a series of 15 cases with different RENAL and PADUA scores for renal tumors, patients underwent RAPN with Brainlab Elements software planning and mixed reality using Magic Leap glasses. The number of intracorporeal ultrasound use decreased with the use of mixed reality and patients had good oncological and functional outcomes.

Adding new technologies has been helpful for better surgical outcomes in various minimally invasive procedures in urology. The use of mixed reality from Brainlab and Magic Leap is feasible and can potentially help during perioperative planning of robotic partial nephrectomy for the treatment of renal tumors.

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Efficacy Of Oral Steroids After Turp In Reducing Incidence Of Bladder Neck Stenosis And Urethral Stricture

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Objective: TURP is a feasible modality for treatment of BPH. Post TURP Bladder neck stenosis and urethral stricture is a known complication. This study aimed at evaluating the efficacy of oral steroids (Dexamethasone) in reducing the incidence of bladder neck stenosis and urethral strictures post TURP. Up to date no study has evaluated the role of oral steroids after TURP.

Material and Methods: In this case control study, patients undergoing TURP, were divided into two groups according to patients receiving (Group 1) and not receiving (Group 2) oral steroid (Dexamethasone 5mg). Both groups were controlled at 1, 3 and 6 months after catheter removal (usually tenth day after TURP) with uroflowmetry, and the flow rates were statistically compared. Incidence of cases of Bladder neck stenosis and urethral stricture were noted in both groups. Dexamethasone was given from POD one onwards for next ten days till the day of catheter removal.

Results: A total of 418 patients were selected for the study as per inclusion criteria. They were divided into two groups as those receiving (Group 1: Dexamethasone group n= 209) or not receiving (Group 2: n=209). None of the patients in Dexamethasone group had Bladder neck stenosis and urethral stricture.

Conclusion: Oral steroids can be used after TURP to reduce the incidence of Bladder neck stenosis and urethral strictures.

Key words: Dexamethasone, Steroids, stricture, bladder neck stenosis, TURP.

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Gut-kidney axis: the role of exercise and symbiotic as a non-Pharmacological aids for patients with chronic kidney disease

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Patients with chronic kidney disease (CKD) experience significant reductions in muscle mass, physical function, individual independence, and overall quality of life. This lower physical function is associated with increased levels of inflammation through the gut-muscle axis, its relationship to tight junctions, and finally dysbiosis. Furthermore, renal failure leads to changes in the intestinal microbiome (Gut-kidney axis) via changes in nutrition and medication, which leads to leakage of bacterial metabolites, in particular uremic toxins into the bloodstream through changes in intestinal barrier properties that all involved in the progress of CKD. In addition, modification in intestinal microbial lines includes enrichment of Eggerthella lenta and depletion in Bacteroides eggerthii, Roseburia faecis, and Prevotella spp. Various therapeutic interventions have proposed to restore the coexistence of the intestinal microbiome which if approved, can remarkably impact the improvement and treatment management of CKD patients. Exercise and nutrition, especially probiotics, are among these interventions. Studies have demonstrated that exercise, mediates through, production of the anti-inflammatory metabolites of SCFA (acetate, propionate, and butyrate) via its effect on the gut microbiome and reduces lipopolysaccharides. In addition, several studies have examined the role of symbiotic in renal function. For example, Zhang et al investigated the protective influence of Shenqi Yanshen Formula against CKD and reported that SQYSF significantly reduced the rate of renal fibrosis in CKD mice, and remarkably down-regulated the expressions of inflammatory markers and even has more potential to change the composition in mice's intestinal flora. However, it is worth noting that studies were carried out on animal models and their mechanisms of action are not fully understood. As a result, despite different exercise modalities and microbiome alteration methods, appears that identifying important variables such as consistent and appropriate exercise type, duration, intensity, frequency, and timing alongside the intestinal microbiome enrichment approach in humans is considerably needed.

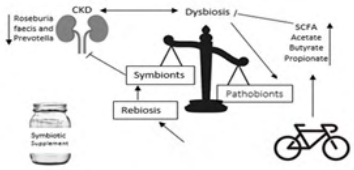

Figure: 1 Interaction between exercise, symbiotic supplement, gut and kidney disease
Gut dysbiosis contributes to kidney disease by increasing uremic toxins and alteration of gut microbiome whereas exercise and symbiotic produce more symbionts and Causes intestinal Rebiosis, which in turn decrease level of inflammation.

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Chemical composition, antioxidant potentials, and calcium oxalate anticrystallization activity of polyphenol and saponin fractions from *Argania spinosa L.* press cake

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Argania Spinosa (L.) press cake possesses a wide range of biological activities, as well as a powerful therapeutic and preventive effect against chronic diseases. The goal of this study is to valorize the anti-crystallization properties against calcium oxalate crystals of *Argania Spinosa (L.)* press cake fractions as well as identifying its bioactive components. Chemical species identification was done using GC-MS analysis. The turbidimetric model was used to investigate crystallization inhibition *in vitro*. Fourier Transform Infrared Spectroscopy was used to characterize the synthesized crystals. Furthermore, both DPPH and FRAP methods were used to assess antioxidant activity. The results show that the fractions are equally important in the inhibition percentages of calcium oxalate crystallization. For the saponin and polyphenol fractions, the inhibition percentages are in the order of 83.49 % and 82.83% respectively. The results of the antioxidant activity by DPPH method show that the two fractions are equally important in the elimination of free radicals; the inhibition percentages were 77.87±4.21 and 89.92±1.39 for both polyphenols and saponins, respectively. FRAP method showed that the absorbance increases correlatively as a function of the concentration and the values are almost similar for both fractions and reaches maximum values in the order of 0.52±0.07 and 0.42±0.03 respectively for saponins and polyphenols. These findings demonstrate that both fractions are rich in bioactive chemicals and have an anti-crystallization capacity, allowing them to be employed in the treatment and/or prevention of stone formation.

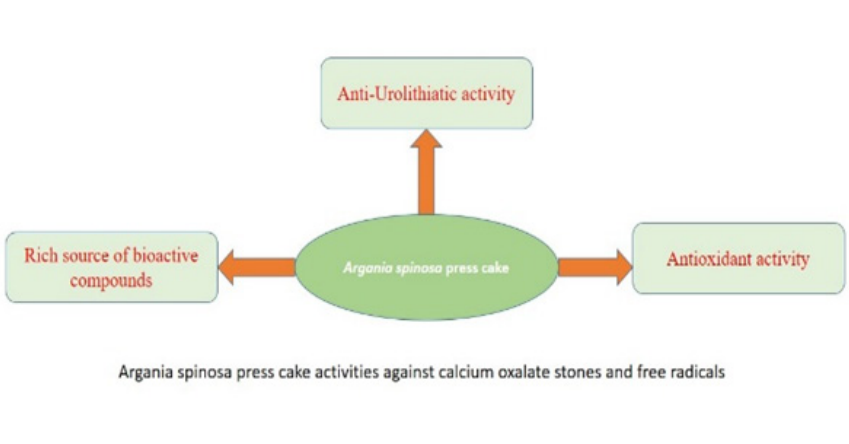

Figure: Argania spinosa press cake activities against calcium oxalate stones and free radicals

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Prevalence of early stage chronic kidney disease in diabetic and hypertensive patients in a tertiary care hospital, northern Ethiopia: a Point-of-Care screening in resource limited setting

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Background: Diabetes and hypertension are primary risk factors for chronic kidney disease (CKD). Therapeutic interventions are most likely to be effective if they are implemented early in the course of the disease process. Due to unavailability of screening strategies, there is no previous study on the prevalence of early stage CKD in high risk populations in resource limited setting, including northern Ethiopia. This study aims to assess the prevalence of early stage CKD and associated factors among diabetic and hypertensive patients using a point of care screening in a tertiary care hospital, Northern Ethiopia.

Method: A hospital-based cross-sectional study design was employed to consecutively sample hypertensive and diabetes mellitus adult (aged >18years) patients visiting Ayder comprehensive specialized Hospital from February 1- 30 March, 2020. Data was collected by interview and from CKD screening test results. Each patient provided a urine sample for albuminuria and a blood sample for creatinine level. Estimated glomerular filtration rate (GFR) was calculated using CKD epidemiology collaboration (CKD-EPI) equation. A bivariate and multivariable logistic regression model was used to assess associated risk factors. P-value <0.05 and 95% confidence interval were considered statistically significant.

Results: A total of 512 (243 hypertensive and 259 diabetic) patients were included in the study. Two-third of these patients (n=343) had microalbuminuria and 17% (n=85) had macroalbuminuria. About 15% (n = 78) of the study participants had an estimated GFR of <60ml/min/1.73m2. Being diabetic was 3.8 times (P-value: <0.001; 95% CI: 1.83, 7.82), and being both diabetic and hypertensive was 5.4 times (p-value: 0.001; 95% CI: 2.09, 14.10) at higher risk of developing early stage CKD than that of only hypertensive patients.

Conclusion and recommendation: A significant proportion of diabetic and hypertensive patients attending follow up in northern Ethiopia developed early stage CKD. Being diabetic and combination of both diabetes and hypertension were independent predictors for developing early stage CKD. More diagnostic resources and implementation of regular point -of -care screening for CKD among high risk patients are of paramount importance for early detection and treatment to halt the progression of the disease.

Key words: Point of care screening, early chronic kidney disease, albumin to creatinine ratio, albuminuria, glomerular filtration rate, diabetes mellitus, hypertension, Ethiopia.