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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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Содержание:

SHORT TERM COMPARISON OF CLINIC RADIOGRAPHIC RESULTS OF TOTAL HIP REPLACEMENT WITH SHORT FEMORAL STEM IN OBESE AND NON-OBESE YOUNG PATIENTS. SINGLE CENTER PROSPECTIVE PILOT STUDY

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Abstract.

Background: Total hip arthroplasty (THA) is a highly successful orthopedic procedure increasingly performed on younger, obese patients due to its ability to improve functional outcomes and quality of life. However, obesity presents challenges related to implant selection and long-term outcomes, particularly with the use of short femoral stems. While short stems offer benefits such as bone preservation and reduced stress shielding, their reliability in obese patients remains underreported.

Aim: Compare functional and radiographic results of THA in obese versus non obese young patients.

Methods: This single-center case-control study evaluated clinical and radiographic outcomes of obese patients (BMI ≥30 kg/m²) undergoing primary uncemented THA with short femoral stems. A total of 120 patients (60 obese, 60 nonobese) were enrolled, matched 1:1. Outcomes assessed included surgical parameters, Harris Hip Score (HHS), Roles and Maudsley satisfaction score, and radiographic implant evaluations at a minimum follow-up of two years. Statistical comparisons were performed using SPSS, with a significant threshold of $p<0.05$.

Results: Operative times and incision lengths were modestly longer in obese patients ($p<0.05$). Mean postoperative HHS improved significantly in both groups, with scores of 91±3.7 (obese) and 93±2.5 (nonobese). Radiographic analysis showed excellent implant positioning, with all components within the Lewinnek safe zone. Minor radiolucencies and subsidence (≤2 mm) were observed in a small subset of obese patients but were clinically insignificant. Complication rates were low and comparable between groups, with one superficial infection in the obese group and one deep venous thrombosis in the nonobese group.

Conclusions: Short femoral stems in uncemented THA demonstrate safe and effective performance in obese patients, yielding clinical and radiographic outcomes comparable to nonobese patients. Short stems provide the added advantage of bone preservation, which is critical for revision surgery in younger, obese populations. Larger studies with longer follow-up are needed to validate these findings and assess long-term implant survival.

Key words. Outcome, Short femoral stem, Obese and nonobese patients.

Introduction.

Total hip arthroplasty (THA) is one of the most successful procedures in orthopedic surgery [1]. Due to its good functional results, quality of life improvement, the indications have extended to younger patient. The actual issue is Obesity, disabling disease, which affects a huge portion of the population particularly in the most developed countries. Therefore, the demand for hip prostheses in young obese patients is growing sharply, some projection models estimate 55% of THA will be obese by 2029 [2]. This implies doubts in choosing the most correct and safe implant, considering the young age and the increased risk of revision due to long life expectancies [3,4].

The reported advantages of short stems include saving bone stock; more physiological load in the proximal femur reducing the risk of stress shielding and avoiding the classical long stems contact with the femoral cortex and consequent thigh pain. Biomechanical studies showed that these metaphyseal-fitting stems exhibit good fixation, achieving durable bone ingrowth. Many papers on normal weight patients and short stems have been published [4,5].

Very little information is reported regarding whether short femoral stems in overweight patients offer the same reliability as in normal weight patients [6].

In particular, there are questions about the risk of increased subsidence and the fact that excessive weight can interfere with osseointegration.

Materials and Methods.

Single center case–control study of the clinical and radiographical outcomes of obese patients that underwent a THA at our institution using a uncemented cup and short femoral stem. The ratio for case and control was 1:1.

Following approval from the Internal Review Board (HJMP 01/2020), patients with hip osteoarthritis who were candidate to receive primary cementless THA at our hospital and who met all eligible criteria, were prospectively enrolled. All patients gave their informed consent.

Inclusion criteria: 1. Minimum 2 years follow up 2. Age 21 to 65 years. 3.Patients diagnosed with body mass index (BMI) of 30 kg/m^2 or greater. 4. Hip osteoarthritis. 5.Presenting pain, limp, sever functional impairment. Exclusion criteria: 1. Previous trauma, infection, or metabolic disease. 2. Previous surgery.

All surgical procedures were performed by the same joint replacement team. Hypotensive epidural anesthesia was administered. A posterolateral approach was performed with piriformis retention and posterior complex reattachment, as described by Pellicci et al. [7]. Femoral neck osteotomy was usually performed 1.5 cm proximally from the lesser trochanter. Acetabular preparation reaming until achieving the templated external size and subchondral bone, definitive acetabular cup was implanted according to recommended cup orientations [8], and 2 cancellous screws were used regularly. Femoral preparation involved the use of progressive compaction reamers.

All patients received an uncemented highly porous acetabular cup, the Jump System ® cup (Permedica Orthopaedics, Merate, Italy) implanted with a 10° posterior lip polyethylene insert.

On the femoral side, an uncemented titanium porous coated short stem with metaphyseal fixation, the Exacta RS® (Permedica Orthopaedics, Merate, Italy) with a CoCr head (Figures 1 and 2).

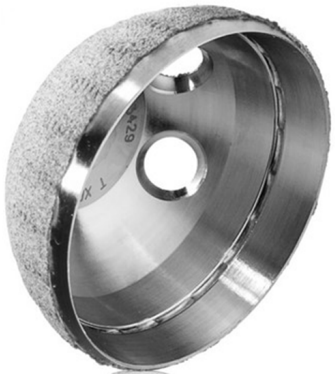

Figure 1. *Jump cup with polar deflection, ribbed equatorial rim which gives an average oversizing of1,000 microns (including coating). HaX-Pore®: double plasma-sprayed porous Titanium and Hydroxyapatite (500 ± 50 µm Ti e 40 ± 10 µm HA).*

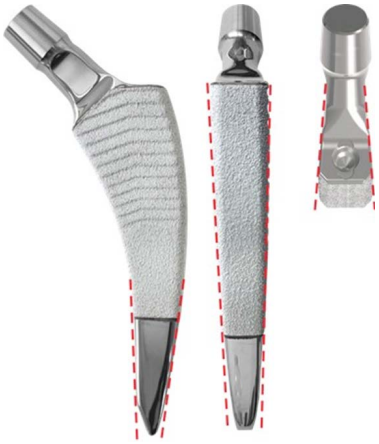

Figure 2. *EXACTA RS triple tapered design with a double plasma spray coating HaX-Pore® in the mataphyseal region (300 µm pure Titanium and 50 µm HA applied with plasma spray technique. 12 sizes and lateral option.*

All patients received antibiotic prophylaxis prior to incision and 3 doses of intravenous cefazolin (1 g/8 h) postoperatively, as well as routine thromboprophylaxis with subcutaneous enoxaparin sodium (40 mg daily) during the first postoperative month. The rehabilitation protocol included early mobilization from the first postoperative day, ambulation with a walker, and full weight-bearing as tolerated.

Demographic data, surgery time, incision length, blood loss, hospital length of stay, and complications were recorded. Clinical and radiological follow-up evaluations were scheduled at 45 days, 3 months, 6 months, and, thereafter, annually.

Clinical evaluation included Harris hip score (HHS) [9], and subjective evaluation according to the Roles and Maudsley score [10].

Radiological evaluation with supine anteroposterior X-rays of the pelvis and lateral X-rays from preoperative and sequential evaluations until the final follow-up. Acetabular cup inclination and anteversion were measured Ackland method [11]. Acetabular radiolucency was assessed according to the DeLee and Charnley classification [12]. Cup and stem fixation was evaluated according to Moore Signs [13]. Cup loosening was radiologically defined as a change in implant tilt > 5°, migration > 2mm, or thick radiolucent line > 1 mm in all three zones on sequential X-rays and/or broken screws [14]. Femoral radiolucency, periprosthetic osteolysis, and stem subsidence were evaluated from prosthesis shoulder to lesser trochanter [14,15]. Leg Length Discrepancy (LLD)measured by drawing a line through the inferior aspect of the teardrops on a weightbearing (WB) anteroposterior (AP) pelvic radiograph and measure the vertical distance of the most prominent point on each lesser trochanter (LT) to this inter-teardrop line [16].

Heterotopic ossification (OH) the Brooker classification was used to determine the presence of OH in the last control [17]. Statistical analysis was performed using SPSS Statistics (version 20, IBM, New York, USA). Continuous variables were reported as mean ± standard deviation and dichotomous variables were reported as number and percentages. The Mann-Whitney test was used to analyze differences between non-parametric variables. Continuous variables were analysed with Student's t-test and dichotomous variables with Fisher Exact test. P value <0.05 was considered statistically significant (Figures 3-7).

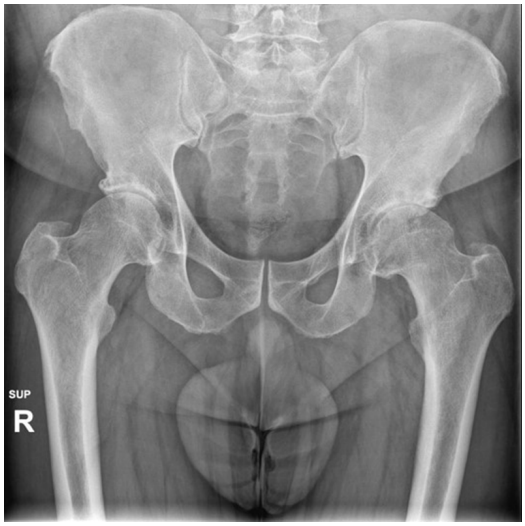

Figure 3. *AP and lateral preoperative radiography.*

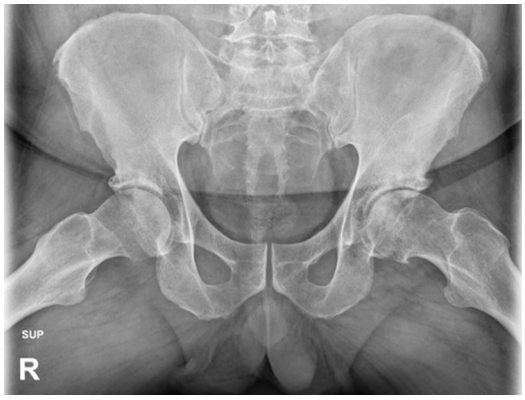

Figure 4. *AP and lateral preoperative radiography.*

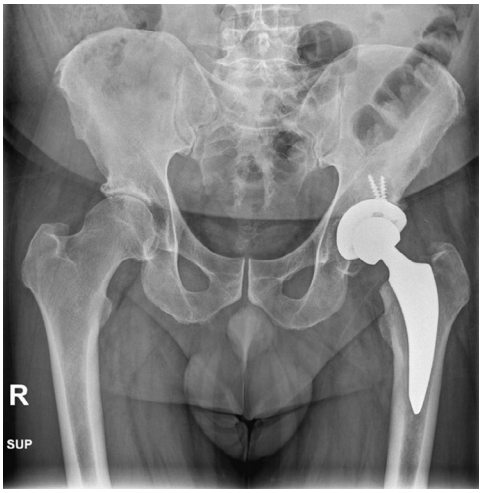

Figure 5. *AP at last follow up.*

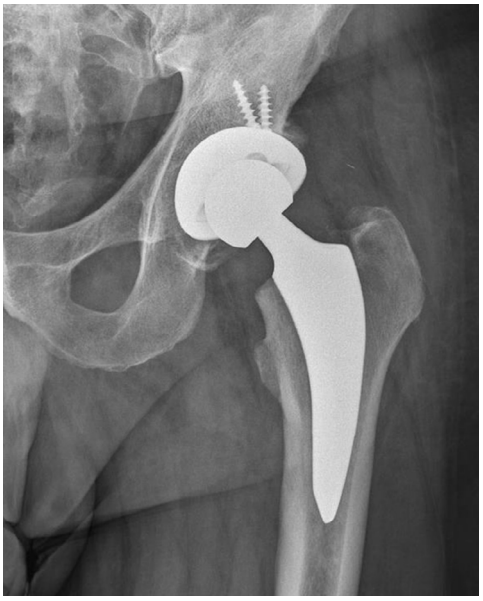

Figure 6. *AP and lateral radiography at last follow up. Trabecular bone surrounding implant.*

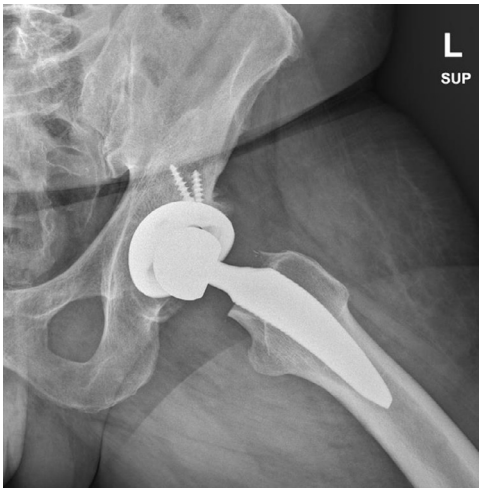

Figure 7. *AP and lateral radiography at last follow up. Trabecular bone surrounding implant.*

Results.

The study included a total of 120 patients divided into:

60 patients in the obese group (BMI) of 30 kg/m^2 or greater, 35.07 ± 4.13 and 60 patients in the nonobese group (BMI) of 29 kg/m^2 or less, 25.43 ± 2.64.

The mean age was 51.8± 10.6 years in the obese group and 52.2±11.0 years in the nonobese group. The mean follow-up was 2.2 years (range 2 to 3 years).

Epidural anesthesia was used in all but 2 in the obese group (due to lumbar spine fixation surgery) and in all the non-obese patients. The average duration of the operation was 60.5 ± 4.5 minutes, with a range of skin incision length between 12 to 17 cm (average of 14.5 cm) in non-obese group and 65.2± 5.8 minutes, skin incision length 16 cms average and range 14 to 18 cm in the obese group. The mean blood loss during the surgery was 375 ± 69 ml. non obese, 432 ± 90 ml. 2 obese patients required postoperative transfusion. The average hospital stay was 4.6 ± 1.5 days, ranging from 4 to 9 days in the obese group and 4 ± 1 days, range 3 to 6 in the non-obese group (Table 1).

Table 1. *Peri surgery data.*

	Obese Group	**Non-Obese Control Group**
Sex (female/male)	37/23	35/25
Age (mean, SD)	51.8± 10.6	50.2±11.0
BMI (mean, SD)	35.07 ± 4.13	25.43 ± 2.64
Operation time (minutes) mean- SD- range	65±5.8 (60 – 90)	62±4.5 (55-76)
Incision length average, range (cm)	16 (14 – 18)	14.5 (12 – 17)
Estimated blood loss (ml) mean, range	432 ± 90	375 ± 69
Length of hospital stay (days) mean- range	4.6 (4 - 9)	4 (3 to 6)
Complications	1 infection (DAIR)	1 DVT

No hip in either group had thigh pain or a revision.

There were no neurovascular complications observed after the surgery. One patient in the obese group required debridement, polyethylene insert change, antibiotics, and retention due to superficial infection at 30 days post-surgery. And one patient in the nonobese group presented a Deep Venous Thrombosis clinically treated after 46 days of surgery.

Radiographic evaluation: The average cup inclination and anteversion were respectively 42°± 3.01 (range 38 to 50°), and 10° (3 to 15°) in the obese group versus control group 43± 5◦ (range 37 to 47◦) and 5 (0 to 15◦); all cups were positioned within the safe range area defined by Lewinnek (Table 2).

Radiolucencies around the cup (less than 1 mm) were detected in 5 patients in the obese group (8.3%) in zone 2 at 3-month follow-up. In 3 cases, the radiolucent lines progressively disappeared as seen on following radiographs, while in the remaining 2 cases, there was no progression or clinical impact, but closer observation was advised. No cup migration or broken screws were observed during the follow-up period.

Table 2. *Radiographic and functional results.*

	Obese Group	Non-Obese Group
Declination angle Average, SD, range	42°± 3.01◦ (38 - 50°)	43◦ ± 5◦ (37 - 47◦)
Anteversion angle Average, range	10° (3 - 15°)	5◦ (0 - 15◦)
Radiolucencies	5 (3 disappear before 6 months)	0
Stem subsidence	2 cases (2mm)	0
LLD Number, average, SD	5 cases (6±3 mm)	3 cases (5±2 mm)
HHS preoperative Average, SD, range	39.4±8.1 points (36–47)	38.7±7.5 points (35–49)
HHS postoperative Average, SD, range	91±3.7 points (87–96)	93±2.5 points (86–96)
Maudsley Roles Score	51 excellent/9 good	46 excellent/14 good

All 5 Moore's radiographic signs were presented in 55 hips while only 4 signs in remaining hips obese group and in 57 hips 5 Moore´s signs and 4 signs in the remaining hips in the non-obese group, thus indicating complete osseointegration of the implants.

There was no femoral radiolucency nor periprosthetic osteolysis detected in the scheduled follow-ups. However, 2 mm stem subsidence was observed in 2 hips in the obese group at 3-month follow-up, but without any clinical or functional discomfort. No loosening of the stem was observed during the follow-up period.

LLD was observed in 5 hips obese group with less than 1 cm average 6±3 mm and in 3 hips in the non-obese group with less than 1 cm average 5±2 mm, in all cases no clinical or functional discomfort was reported.

No OH was detected in the radiographic follow up.

Clinical evaluation: Mean pre-operative Harris hip scores were 39.4±8.1 points (range 36–47 points) in the obese patient group and 38.7±7.5 points (range 35–49 points) in the non-obese patient group. At the last follow-up mean postoperative Harris hip scores were 91±3.7 points (range 87–96 points) in the obese patient group and 93±2.5 points (range 86–96 points) in the non-obese patient group. According to the Roles and Maudsley Patients' satisfaction score, in the obese group 51 patients was excellent and 9 good, and in the non-obese group 46 patients excellent and the 14 good.

Discussion.

In this study about the effect of obesity on the outcome after THA using short stems can be safely and effectively performed in both obese and nonobese patient populations with comparable clinical and radiographic outcomes.

Obesity presented challenges that modestly influenced surgical parameters, such as longer operative times and slightly increased incision lengths in the obese group [18,19], our results are consistent with reported results obese patients had longer operative durations (65.2 ± 5.8 minutes vs. 60.5 ± 4.5 minutes in nonobese patients), and not influencing in the complication rate as stated by Zingg, Chaimmi, Hinz and Onggo [19-22].

The better approach is still under discussion, but in a review by Shah posterior approach showed similar results in obese and non-obese patients, with almost similar rate of complications.

The marginally higher average blood loss (432 ± 90 ml vs. 375 ± 69 ml) in obese patients was within an acceptable range and did not lead to significant clinical consequences, aside from two obese patients requiring postoperative transfusion. Similar findings have been reported in prior studies, such as those by Onggo and McLaughlin [19,23,24], which highlight increased technical complexity and tissue handling requirements in obese patients undergoing THA.

Longer hospital stays in the obese group align with increased physiological demands for recovery, as noted by McLaughlin, and the increase possibility of higher indirect costs as suggested by Lewallen. In all cases preoperative controls and rehabilitation simulations as well as tailored postoperative pain control will help patient to start mobilization as soon as possible [19,24-26].

Postoperative complication rates were low in both groups, reflecting the safety of the procedure. One obese patient experienced a superficial infection that was successfully managed with DAIR, and one nonobese patient developed a deep venous thrombosis, which was clinically resolved with anticoagulation. Chammai observed comparable rates of complications in obese patients (7.3%) and nonobese patients (9.8%) undergoing short stem THA with the Metha prosthesis [21]. These findings underscore the importance of vigilant perioperative management, particularly in obese patients who are predisposed to infection and thromboembolic events [27].

Radiographic Findings.

Radiographic analysis revealed excellent implant positioning, with all components placed within the Lewinnek safe zone. Pirard analysing 323 THA found no influence of the BMI on component positioning, while Elson highlighted an association between BMI and cup mal-positioning, and varus valgus dispersion on the femoral standard stem. In our series only the posterior approach is used since it allows excellent exposure, cup position in the safe zone was achieved in all cases in both groups [28,29]. The minor radiolucencies observed in the obese group resolved or remained clinically insignificant, consistent with prior studies indicating that early radiolucencies do not necessarily predict long-term implant failure [4,30].

Osteointegration in the majority of patients is a testament to the robust fixation and implant durability. Notably, the 2 mm stem subsidence observed in two obese patients was within acceptable limits, without progression and clinical impact, aligning with results reported by Berend [4,31].

Our evaluation on the femoral stem showed similar results as Wallroth and Issa with excellent evolution and osteointegration of the stems [32,33].

Clinical Outcomes.

The significant improvement in HHS across both groups reflects substantial functional recovery. The mean postoperative HHS of 91±3.7 in the obese group, while slightly lower than 93±2.5 in the nonobese group, still represents excellent outcomes, was higher than in the studies by Chammai et al. with 87.54 in obese and 92.49 in non-obese patients [21]. This is consistent with findings from Jackson, Wallroth and Goh [32,33,34], which demonstrated comparable functional improvements in obese and nonobese patients.

The non-obese group had a significantly higher postoperative HHS and a greater satisfaction score, similar to the results

obtained in our series, we believe the main reason is the group start with higher impairment and worse HHS scores, similar as suggested by Sexton in a match control study of 134 patients with the use of uncemented standard stems [33].

Patient satisfaction, as measured by the Roles and Maudsley score, was high in both groups, reinforcing that obesity does not detract from the perceived success of THA when performed with precision and care [32,33]. In a comparative of 192 cases similar results were obtained at 2 years minimum follow up in both groups [34].

LLD was observed in a small number of cases (5 in the obese group, 3 in the nonobese group), all clinically irrelevant no causing patients' discomfort (<1 cm). Accurate preoperative templating and intraoperative checks, as emphasized by Fujita [35], in their study on 132 patients showed are critical to minimized Lle and achieve favorable outcomes and that 7 mm may be a reasonable threshold for reducing the residual discomfort. In our series all cases have less than 7 mm discrepancy.

Study Limitations.

The relatively small sample size although the minimum number for statistic inference was obtained. Additionally, the follow-up period of 2.2 years limits the ability to assess long-term implant survival and revision rates, but promising radiographic results were achieved with all implants osteointegrated according to Moore signs. Advantage of single brand prosthetic implants were evaluated.

Conclusion.

The results of this study are promising showing that uncemented cups and short stems THA is a valid option in obese patients in whom traditionally standard stems are used. Focused on Short stems results obtained, they were able to withstand overload, achieving excellent osseointegration and implant stability. Considering the high risk for revision in the obese group, short stems are preserving bone representing an advantage in case of revision surgery and in long life-expectancy patients.

Further studies with longer follow up and larger sample are needed to provide solid statistical evidence.

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