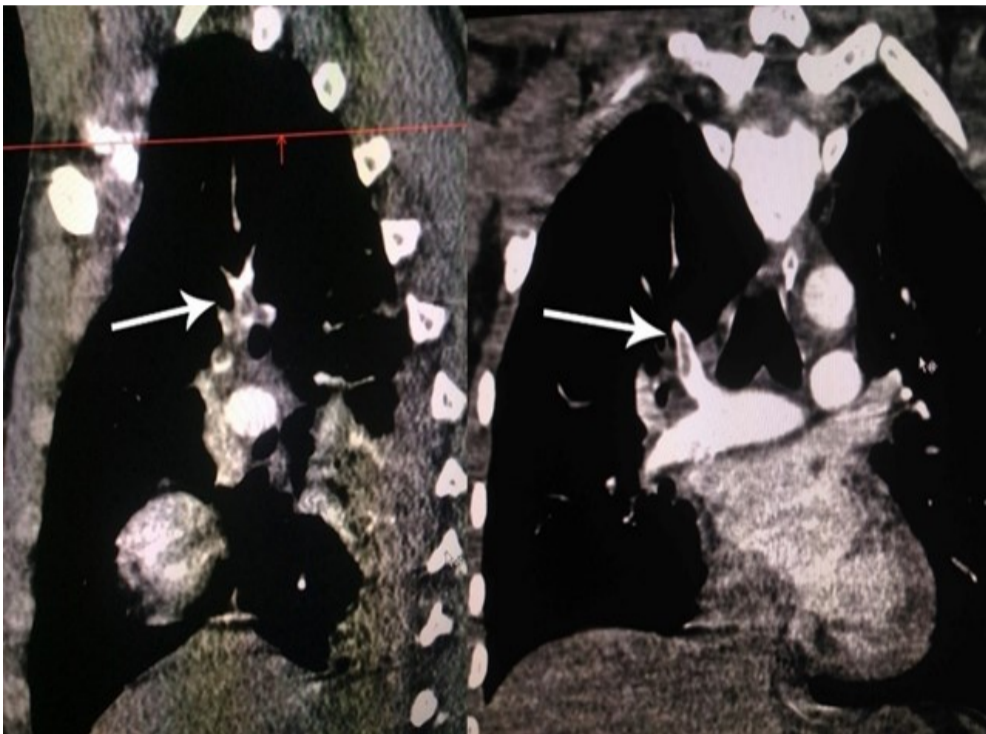


# JOURNAL OF HEALTH & TRANSLATIONAL MEDICINE

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Journal of Health and Translational Medicine



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Authors are responsible for the accuracy of all references. The editor can only check for correctness of format. Follow the examples of forms of references as shown below.

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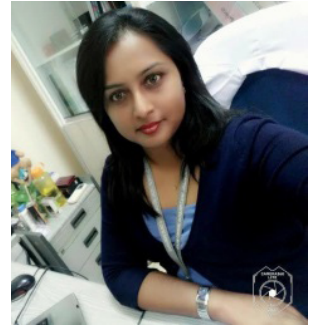
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## ***Foreword from the Editor***



Dear JUMMEC readers,

A progressive and continued endeavours by the editorial board of JUMMEC is focused on bringing constructive and insightful research and experimental findings would be outstanding. Moreover, a series of, reviews and case reports reporting the overall health and translational research aspects stemmed from across the medical research disciplines clearly would suggest that it is incumbent upon me, and thus it is my pleasure to meet you in the 20<sup>th</sup> Volume (Issue 1) of the journal documenting the overall perspectives. A significant progress and breakthrough in patient-oriented health and translational research have been witnessed in past years which was possible due in part through mutual collaborative efforts by scientists and medical practitioner. An insight into the fundamental science underlying the disease mechanism and outcomes of therapeutics in the development provides guidance and knowledge dissemination. Therefore, it is instrumental for further development of research and for truly realizing the tangible benefits in medical field would be important. As such, the first issue of this volume of this journal constitute the very essence of such insights.

Injury in sports especially involving ligament damage is the most common; leading to the functional loss of the tissue. A cross sectional study by Kalimuthu M and Mokhtar AH at University of Malaya Medical Center in 19 patients who have ruptured their anterior cruciate ligament showed reduction in muscle strength and proprioceptive ability in the ligament deficient knee compared to the normal. It has been suggested by the team that having rehabilitation after knee injury to help patients may lead to a better surgical outcome, and thus warrants further future investigation. While understanding the pathophysiology of the disease is an important aspect of improved healthcare system, a questionnaire based survey/ interviews conducted in health centers in Kampala Capital City Authority by Nabukeera M et al focussed on investigating the impact of shared health services on quality on healthcare services and tangible outcomes highlights some interesting findings. The results showed that sharing health services had a significant effect on the degree of responsiveness regarding promptness, assurance and empathy in the delivery of the services, suggesting that health services quality would improve through recentralisation of these services and healthcare support.

JUMMEC has been always paving a platform for clinician and health care providers to disseminate the outcomes of case studies of both common and rare diseases that brings strong learning values. Ong ECW and Kong CK team have presented a rare case of massive ruptured malignant Phyllodes tumour and its subsequent management. This malignancy being rare fibroepithelial type of breast tumours required staged surgeries and this patient in particular had tumour infiltrating the 5th and 6th ribs, but no distant site emetastasis. Authors have shared very insightful discussion on managing the treatment and patients not to be missed. Another rare case report by Jien et al discussed unusual case of double pathology - both pulmonary thromboembolism and fat embolism syndrome in a patient with bilateral femur and bilateral tibia fractures. Authors have suggested that a consideration must be given for those patients with multiple long bone fractures for any coexistence of fat embolism syndrome and pulmonary thromboembolism to prevent morbidity and mortality.

As we continue to strive to provide quality and prompt publishing service facilitated by team of editors that represent various niches of health and translational research, and the journal's administrative support group, we share the passion to foster dissemination of accelerated research findings for improvement of health care system, ultimately with fellow researchers. On behalf of the editorial board and its members, I hope you find our publication service engaging and that you will consider JUMMEC when submitting your valuable work.

We are looking forward to your contributions.

**Thamil Selvee Ramasamy**  
Managing Editor (Volume 20 Issue 1)

# MUSCLE BULK, STRENGTH AND PROPRIOCEPTIVE DIFFERENCE BETWEEN ANTERIOR CRUCIATE LIGAMENT DEFICIENT AND NORMAL KNEE

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## ABSTRACT

The anterior cruciate ligament (ACL) deficient knee has been subjected to various research and many conclusions have been drawn to the loss of function in relation to it. ACL reconstruction is also very commonly done as this ligament damage is the most common injury in sports. Muscle strength and proprioception have been postulated to be affected alongside this injury. We conducted a cross sectional study in 19 patients who have ruptured their ACL. We measured their muscle strength, thigh muscle bulk and proprioception in comparison to their contralateral normal knee. The Biodex Isokinetic machine was used to measure the muscle strength and proprioception. The thigh circumference was measured manually using a measuring tape. There was significant reduction of muscle strength and thigh circumference in the ACL deficient limb as compared to the normal side,  $p < 0.05$ . The affected knee also showed reduction in proprioceptive ability at 70 degree angle (z score -2.17,  $p < 0.05$ ), but there was no significant reduction at the other angles. These findings are important as the data show that there is reduction in muscle strength and proprioceptive ability in an ACL deficient knee; hence, rehabilitation addressing these two areas should be emphasized pre-surgery.

**Keywords:** Anterior cruciate ligament, circumference, position, power, sense, thigh

## Introduction

The anterior cruciate ligament injury is a common injury that occurs in individuals active primarily in sports and recreational activities (1). The injury causes loss of muscle function (as the strength profile of the quadriceps and hamstrings are affected by the neural effect of the ACL injury), and disuse of the limb. However, the main focus has always been investigation of thigh muscle weakness post reconstruction (2). Comparison of muscle group (thigh flexors and extensors) strength difference, and donor site comparison with reference to strength deficit, seem to be a heatedly debated topic. A study showed that the quadriceps strength deficit was less than that of the hamstring, despite the use of a hamstring graft (3).

Besides muscle strength, joint proprioception has also been the subject of interest over the past 100 years.

Proprioception, in the early years termed "kineasthesia", means appreciation of joint position sense via afferent signals from skin, muscle and joints (4). The ACL deficient knee has been studied and demonstrated to have diminished proprioception, delayed reflex responses of the muscle and altered neuromuscular control (5). Proprioception gives information regarding the movement and the position of our leg, which is important for muscular control (6). It was stated that the mechanoreceptors responsible for proprioception constitute 1-2% of the bulk of the ACL tissue and are situated near the tibial and the femoral insertions. We hypothesize that patients with ACL deficient knee will have less muscle strength than the contralateral normal knee. Recently, a lot of importance has been placed on the role of surgery in the treatment of ACL rupture. Many questions have been raised with regards to the loss of muscle strength and the role of



proprioception after the injury. Many surgical techniques and how they affect the restoration of normal function of the knee have triggered investigations exploring methods to improve the eventual results of surgery, and that of pre-surgical intervention. Several studies performed on ACL injury, however, were conducted outside Malaysia, and most studies concentrated on muscle strength and proprioception changes postoperatively, rather than preoperatively (1,7–9).

In this study, the differences in quadriceps and hamstring muscle bulk and strength between the ACL deficient and unaffected knees of the same individuals were investigated. Additionally, proprioceptive changes between the injured and uninjured knees were also explored.

### **Methods**

A cross sectional study on the ACL deficient knee, as well as on the contralateral knee, of each patient, was done to compare the bulk of thigh musculature (quadriceps, hamstrings), muscle strength and proprioception. The study was conducted at the Sports Medicine Clinic, University of Malaya Medical Center between January 2012 and August 2014.

Male patients of 17-40 years old, with ACL injury, were invited to participate in this research. The participants in this study were clinically diagnosed with complete tear of the ACL, and the diagnosis confirmed with magnetic resonance imaging. Patients who had contralateral knee injuries, previous knee injuries or surgeries, persisting pain and inflammation of the knees, were excluded from this study.

Information about the study, and the procedures involved, were explained to potential participants, and the study information sheet distributed to them. Upon enrollment, information on socio-demographic information, including date of birth, gender, ethnicity, date of injury and date of diagnosis were gathered. Following this, the physical assessment of the quadriceps and hamstring muscle bulk, muscle strength and joint proprioception were performed. The quadriceps and hamstring bulk of the ACL deficient knee were measured first in all participants. This was performed using a measuring tape (to the nearest decimal point) with patients in supine position, exposed appropriately with the knee flexed to about 10 degrees. The thigh circumference was measured at 5, 10 and 15 cm proximal to the superior pole of the patella. The same investigator then repeated the measurement on the contralateral normal knee.

The quadriceps and hamstring strength was measured using the Biodex Isokinetic Dynamometer (Biodex System 4 Pro, New York). The Biodex has been shown to be a

reliable instrument to measure the isokinetic peak torque in humans (10). Each patient was asked to warm up on a stationary bicycle for about 10 minutes before the test. The patient was strapped in and secured at the shoulders, chest and hips. Device set-up and subject positioning were as per the manufacturer's guidelines (Biodex system 3) which were similar to methods conducted in previous researches (11). Isokinetic testing was performed at 120 degrees/sec followed by 180 degrees/sec. These angles were chosen as they do not add extra stress to the ACL deficient knees (3). Three trials were allowed before the actual test. The angles were tested with a 30 second rest in between. The order for testing the injured knee and the contralateral normal knee was carried out randomly.

Finally, proprioception was tested at 3 separate angles. The joint position sense was tested at 45, 60 and 70 degrees (5,11–13) of knee flexion. The patient was seated on the Biodex, similar to the one used before, and then the knee, at random order, was moved to 45 degrees from 90 degree flexion and kept in the same position for 5 seconds. The patient was asked to remember this angle, and then the knee returned to flexion at 90 degrees. The patient, then with his eyes closed (to avoid visual input) attempted to reproduce the 45 degree angle. The mean degree of error was documented and used for analysis. The patient was given three attempts. After that, the other two angles (60 and 70 degrees) were tested in similar fashion (14). Our hypothesis was that proprioception will be altered in ACL deficient knee as compared to the contralateral normal side. This theory has been proven in previous tests (4,15).

The data analysis was carried out using IBM SPSS Statistical Package 21, Armonk NY, and  $p < 0.05$  was considered statistically significant. The variables collected from the patients were calculated as means  $\pm$  standard deviation. Most of the variables were tested with Shapiro Wilk test and they demonstrated normal distribution ( $p > 0.05$ ). The data that did not follow normal distribution were calculated using the median  $\pm$  IQR, and tested with Wilcoxon Signed Ranks test.

### **Results**

A total of 19 male patients between the age of 17 and 40 years (mean age 27.53) participated in this research. 16 were Malay and the other 3 were Indians. Eleven (57.9%) patients had complete rupture of ACL diagnosed on the right side, and eight (42.1%) with ruptured ACL diagnosed on the left. The mean height and weight of the subject population was 169.0 cm and 73.34 kg respectively. The mean BMI was 25.78. The results of the study are presented below. Tables 1, 2 and 3 show the peak torque, thigh circumference and proprioception between the injured versus the uninjured knee respectively.

**Table 1:** Peak torque of the injured and uninjured knee at two different speeds

Peak torque (Nm)	Injured Mean $\pm$ SD	Uninjured Mean $\pm$ SD	T score/z score*	df	P value
120 flexion	69.8 $\pm$ 43.1	98.9 $\pm$ 53.6	-3.06*	-	<0.001
120 extension	102.66 $\pm$ 39.5	138.50 $\pm$ 35.64	-7.3	18	<0.001
180 flexion	50.98 $\pm$ 19.62	66.58 $\pm$ 19.55	-4.6	18	<0.001
180 extension	79.68 $\pm$ 30.54	103.31 $\pm$ 32.0	-4.9	18	<0.001

df: degree of freedom

SD: standard deviation

p &lt; 0.05 is considered statistically significant

**Table 2:** Thigh circumference of the injured and uninjured knee

Thigh circumference (cm)	Injured Mean $\pm$ SD	Uninjured Mean $\pm$ SD	T score	df	P value
5	42.58 $\pm$ 4.17	44.26 $\pm$ 4.29	-6.9	18	<0.001
10	47.74 $\pm$ 4.63	49.26 $\pm$ 4.62	-8.6	18	<0.001
15	51.74 $\pm$ 4.83	53.74 $\pm$ 5.02	10.7	18	<0.001

df: degree of freedom

SD: standard deviation

p &lt; 0.05 is considered statistically significant

**Table 3:** Proprioceptive findings in the injured and uninjured knee

Proprioception	Injured Mean $\pm$ SD	Non injured Mean $\pm$ SD	T score/ z score*	df	P value
45	5.25 $\pm$ 2.92	4.53 $\pm$ 2.72	0.9	18	0.39
60	2.7 $\pm$ 3.2	4.4 $\pm$ 4	-1.22*	-	0.22
70	1.7 $\pm$ 1.6	3.2 $\pm$ 3.8	-2.17*	-	0.03

df: degree of freedom

SD: standard deviation

p &lt; 0.05 is considered statistically significant

As shown above, there is significant difference in peak torque between the injured and the uninjured knee at both 120 and 180 degrees/sec, less peak torque seen in the ACL deficient side. The thigh circumferences at 5, 10 and 15 cm of the injured side were significantly less; p<0.05 compared to the uninjured side. There were no significant differences in knee proprioception assessed at angles of 45 and 60 degrees; between the injured and uninjured side. However, proprioception assessment at 70 degrees of knee flexion showed a significant difference between the injured and uninjured side.

### Discussion

The aim of this study was to investigate the difference in the quadriceps and hamstring strength, muscle bulk and knee joint proprioception in a normal compared to an ACL deficient knee. Our result showed that there was a significant difference with regards to hamstring and quadriceps strength and bulk; however, with regards to

proprioception, there was a difference but not in all the angles tested. The subjects were tested on the Biodex at 120 and 180 degrees (flexion and extension) and all the tests showed that there was a significant difference between the muscle strength of the injured and the uninjured knee with p values less than 0.05. These findings are in agreement with those in reported literature (2). Previous studies, however, focused on post-surgery thigh strength measurements (1,16). Only a few had obtained pre-surgery data, and most had comparisons to chronic ACL tears (18 months). Those studies examining patients with a duration of injury are uncommon. ACL injury has been proven to cause atrophy of the quadriceps and hamstrings. A previous study reported 8% reduction in size in cross sectional area of the thigh in ACL deficient limb (17). Our study revealed a significant difference in thigh cross section, measured manually, and consistent with findings of previous studies. The proprioception measurements revealed a significant difference in the 70 degree evaluation (p<0.05) but the 45 and 60 degree evaluations were not significant (p>0.05).

We used a Biodex machine in this research. This method is purely computer controlled and therefore reduces the error observed in human dependent methods. However, a person who is properly trained is needed to operate the machine. The reason for the significant difference has been postulated to be due to a direct inhibition of the quadriceps by knee effusion and capsular distension (6).

The conflicting results of the proprioception tests may be attributed to several reasons. Firstly, the proprioception tests were carried out immediately after testing the peak torque in the knee. Muscular fatigue has been postulated to affect proprioception (18–21). The subjects may not have been able to reproduce the desired position due to muscle fatigue but as the effect wore off, at 70 degree angle - tests were performed at 45, 60 and 70 degrees in that order - the performance accordingly produced the desired result. Secondly, the subjects may have taken time to understand the instructions of the tests and to familiarize themselves with the technique of assessment. Therefore, they needed several attempts before complying with the instructions. Finally, as mentioned earlier, the other structures (i.e. collateral ligaments, meniscus) that were injured along with the ACL may have caused some alterations in proprioception, thus affecting the outcome of the tests.

Several other limitations need to be addressed in the current study. Firstly, included in this study is the heterogeneity of ACL injuries-for instance, the majority of patients in this study had a combination of complete ACL rupture with other structural damages (like meniscus and collateral ligament injuries). A more conclusive data could have been obtained from patients with isolated ACL injury (22). The other limitation of this method is that only manual measurement was used; if the usage of MRI was included, we could obtain the actual size of the musculature and also identify the group of muscles involved and these data could be discussed. Previous reports suggest that the quadriceps atrophies more significantly compared to the hamstrings (23,24). The patients were also examined at various time intervals after the injury, ranging from 4 weeks to 24 months. Therefore, it was difficult to quantify the rate of muscle atrophy with time, both in the acute or chronic stage. Each of the measurement points (eg. 5,10,15 cm) represents groups of muscles as reported in a previous study (25). Finally, it is advisable to test the muscle strength and proprioception at different sessions, as muscle fatigue may interfere with accurate data collection.

### Conclusion

This research shows that rupture of the anterior cruciate ligament causes reduction of muscular strength and bulk, and it also affects proprioception. Previous studies have reported similar results after surgery has been performed, and some patients take years before they develop muscle strength comparable to the contralateral normal knee. More emphasis has to be put on pre surgical rehabilitation. The patient should be put on muscle strength training and

also proprioception with balance training (e.g. perturbation training, elastic band exercises, body weight training). This can help reduce the loss of muscle strength and bulk after injury. However, caution must be given to avoid certain exercises as it can cause further damage (e.g. chondral injury) to the ACL deficient knee. Examples of exercises to be avoided are the open chain type of muscle strength training for the lower limb.

More research has to be done after injury to the ACL, before the surgical intervention period, as rehabilitation after knee injury may help patients to have a better surgical outcome. Patients are normally concerned about how the surgery is going to help them lead an active lifestyle. With proper rehabilitation pre- and post-surgery, this can be obtained.

### Acknowledgement

I would like to thank the participants who agreed to take part in this research. Without their consent and cooperation, this work would not have been made possible. Their approval to allow me to put them on the Isokinetic machine which requires a fair amount of effort on their side has given me an opportunity to collect much valued data. I also would love to extend my highest gratitude to my supervisor, Associate Professor Dr Abdul Halim bin Mokhtar for allowing me to pursue this topic for my research.

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# IMPACT OF SHARED HEALTH SERVICES ON SERVICE QUALITY AT HEALTH CENTRES IN KAMPALA CAPITAL CITY AUTHORITY (KCCA)

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## **ABSTRACT**

The study aimed to assess whether sharing of health services improved service quality in health centers in Kampala Capital City Authority (KCCA). With multi-stage sampling, data was gathered by face to face interviews, via translators from residents in the five divisions of KCCA, using a questionnaire. Schedules were made with Local Council I chairmen, and support to fill in the questionnaire was given to the respondents. The statistical methods used for analysis included a Chi-square, Spearman correlations and hierarchical regression.

The study found that regarding tangibility, sharing health services significantly determines the number of modern medical equipments ( $p=0.000$ ) and the number of medical personnel that had a neat and professional appearance ( $p=0.000$ ) but did not determine the number of visually appealing health facilities ( $p=0.386$ ).

Recentralizing health care changed the mode of delivery. Health workers were responsive, reliable and provide better care for patients. There was increased availability of basic medical equipment, and health workers were neater in appearance with increased confidence and hence were better able to provide for the safety of residents.

**Keywords:** Healthcare, KCCA, shared health services, service quality, Uganda

## **Introduction**

Shared services are defined according to Oakerson (1), as “agreements involving two or more public organizations cooperating to render services for the common good of the people”. Health service quality refers to the four basic components in the health care system, the personal, the technical, the atmosphere and the organizational quality (2).

The quality of healthcare in Uganda is not determined by the people’s ability to pay for the services, but by the health structure that the government puts in place to ensure that all Ugandans receive better health care as a way to poverty eradication (3, 4). Uganda has a population, estimated at 24.4 million people, and it is supported by a medical workforce of 40,000, of which 40% are employed by the private sector (5, 6). Of the total number of health workers, with only 2,919 are medical doctors and 20,186 nurses and midwives, an increase in life expectancy at birth from 46.9 in 2001 to 51 years was seen in 2006 (7).

Uganda is among the countries in sub-Saharan African that still encounter challenges in reduction of mortality rates. Major direct sources of death among adults being Human Immuno-Deficiency Virus (HIV) infection and the Acquired Immuno-Deficiency Syndrome (AIDS) which are responsible for 20% of the mortality. Malaria continues to be the most significant illness in economic loss, morbidity and mortality, although Ministry of Health reports show 20% reduction in outpatient cases over all these years (5). The other diseases affecting the country are mainly the non – communicable diseases of diabetes, cardiovascular disorders, cancers and chronic respiratory illnesses that have been forecast to increase to 17% in the next ten years (5).

Over 45,000 neonatal under five days and 28 days deaths are registered annually with 50% occurring within 24 hours of life, according to the 2006 Uganda Demographic and Health Survey (UDHS). The leading cause of deaths among newborns are; measles, poliomyelitis, whooping cough, tetanus, tuberculosis, diphtheria, Hepatitis B, and

Haemophilus influenza (5). The leading direct causes of death among women are haemorrhage (26%), sepsis (22%), obstructed labour (13%), unsafe abortion (8%) and hypertensive disorders in pregnancy (6%) (5).

The core factors accountable for maternal deaths are mainly personal and structural; they include delayed care seeking, failure or delay in reaching the health center, and delay in providing institutional care. This is well described as the "three delays" where mothers have not been empowered to be good decision makers on issues concerning their health in the household. This is due to high levels of poverty leading to a lack of autonomy (8, 9). A lack of planning due to low levels of education has resulted in an over dependency that hinders women in reaching the health centers on time to receive appropriate treatment. There is also an inconsistency in the availability of medicines in the health centers with poor paid health workers so that there are delays in receiving adequate treatment in health centers. Birth readiness, includes identification of the expert birth medical consultant, availability of health centers, saved prepared money, ascertaining of means of transportation and extra arrangements for childbearing women. Research has shown that women who are natively equipped will more likely to be supported by health workers and birth assistants (10).

While some progress has been made in urban settings, rural areas have not changed much due to inaccessibility of the roads, collapsed referral system. There is insufficient funding for necessary expenditures like ambulance fuel and maintenance, as well as delay in receiving supplies. With a poor road network, there is a scarcity of blood availability, and there is an absence of emergency medicines (5).

On 1<sup>st</sup> March 2001, the Government of Uganda abolished user charges in public health centers enabling the poor to receive medical care and improve their health seeking behavior (7, 11). The abolition of user charges was aimed at achieving the Millennium Development Goals on a national, regional and international scale. The Ministry of Health together with private not-for-profit and private health partners have joined efforts to reduce the Maternal Mortality Ratio by 70 deaths per 1000000 live births from 2001 to 2006 and the Infant Mortality Rate by 14 deaths per 1000 live births in 2006 (5). Although modest success has been registered, the health system in Uganda still has some challenges that hamper achievement of quality primary health care targets. The early success would not have been achieved if Government of Uganda had not stop charging user fees for health care in public health centers where utilization was reported to have increased to 55% in 2002 from 26% in 2001. Essential drugs were often still inadequate (12).

Health services for Kampala Capital City Authority are situated within the five divisions. Each division has two health centers: City Hall and Kisenyi Health Centres for Kampala Central Division; Kawempe City Council and Komamboga health centers for Kawempe division; Kitebi and Kawala health center in Lubaga division; Kiruddu and

Kisuggu health centres in Makindye Division; and Kiswa health center and Naguru hospital in Nakawa division.

### ***Understanding the concept of sharing dimension of health services in health centers, and hospitals in KCCA.***

With a small, inadequate budget in the health sector, KCCA is overwhelmed with the demand for quality and efficient health services by the citizens. The health centers are sharing ambulances, human capital, medication and medical equipment. Shared services in KCCA operate in such a way that they promote trust and good working relationships among medical workers and patients. There is improvement in clinical diagnosis and management. Coordination blind spots are avoided, and unnecessary wastage of time for patients visiting another health center are reduced. There is support the performance of necessary tests. There is an improvement in the availability of drugs, the quality of social welfare, and the reduction in the costs of the health service. Above all, lives are saved.

Quality healthcare services are delivered by health workers whose numbers and welfare are the key to success. There are unfilled vacancies for nurses countrywide; at health centers II, III and IV, there are vacancies of 53%-54% and 37% respectively (5). This state of affairs puts a huge burden to the already overstretched public health delivery system. This, in turn, affects access to effective health care which later transforms into an unreasonably high child and maternal mortality. Only 36% of children obtain basic vaccinations at the age of 1 year, 42% of mothers deliver under the supervision of a skilled health personnel while only 29% of children below 5 years with malaria receive treatment within 24 hours of onset of fever (13).

Information on the medical care needs of the people and the obstacles to medical care are required to assist in planning for the quality improvement of medical services for cities like Kampala. Health planning is of great significance as African countries are presently undergoing pressure to improve the quality of their health care services.

Shared service theory argues that partnership working can result in improved performance. Hence, greater efficiency can be achieved by working across organizational boundaries. Fundamental to this standpoint is the flexibility the arrangement brings. There are additional capital and increased capability of working across boundaries to solve priorities, and of diverting resources like 'decisions, talent, rewards and actions to where they are most needed' (14). Theorists who advocated for partnership working proposed that it provided a mechanism to maximize resources (15, 16). They also noted that partnership working negotiated for benefits of 'improved service delivery and policy success through the combined activities of agencies' (17). They argued that public-public partnerships could provide greater efficiency and reduce transaction costs.

Innovation was not just a good impression or a discovery, but 'an application of new processes, services and approaches

of delivery that resulted in important improvements in results, efficiency, effectiveness or quality' (18). Osborne and Brown (19) wrote that implementation was centered on innovation, 'involving and adaptation of new ideas within new settings'.

### Objective

Considering the ongoing sharing of health service delivery among the ten health centers of KCCA, this study aimed at determining whether sharing of health services improved service quality. The study would assess how sharing of health services had affected the five dimensions of quality using SERVQUAL.

Service delivery performance could be enhanced by evaluating the status of shared services in the health sector using the three dimensions of cost, quality and service equity, (CQS). These dimensions of performance could provide a complete picture of what constitutes a shared service in KCCA. Within the general context, the study would only address service quality with the following question:

(i) Do shared service partnerships affect health service quality?

Only the service quality component of shared services performance would be measured as the remaining two dimensions were outside the scope of our study. Studies on the quality of health care in Uganda has been well covered (20-23) but there had been no prior study that set out to explore the effective performance of shared services and its impact on service quality in KCCA.

### Methods

The ethical clearance was acquired from the Directorate of Public Health and Environment, and authorization was approved by Dr. Semuwemba James, the Acting Director. Administrative units included villages without health centers, in the survey as residents travel to the same health centers to receive medical treatment. Using cluster sampling, data was collected from KCCA employees and residents from different parishes were selected and head of households were chosen who the questionnaire was administered. Interviews were also conducted in two (2) villages per division to allow focus group discussion at the health centers (24).

**Table 1:** Administrative units of KCCA and Number of population with health centers

County	No. of sub-county	No. of parishes/wards	No. of villages/Zones/cells	No. of health centers	No. of population
KCCA	5	96	2959	8	2,489,442

Source: Uganda population and Housing Census Kampala Report November 2005 p.15

Basic sampling units were selected within groups of named clusters (parishes) and a survey performed in each stratum. There were 30 clusters, 20 voting age persons in each cluster. In the 1<sup>st</sup> stage, there was a random selection of clusters, wherein the entire population of Kampala was divided into small distinct geographic areas, as parishes and an approximate size of the population for each "parish" was found. At this stage, the primary sampling unit (PSU) was the parish. Afterwards, clusters were assigned randomly to parishes. For the 2<sup>nd</sup> stage, the random selection of voting age persons within clusters was completed using systematic random sampling. In summary, cluster sampling through a multi-stage sampling method was completed in 2 stages was used for the study.

The questionnaire required residents to help collect data on back ground information, their opinions on health services and service quality. A pilot study of the questionnaire was conducted at Kitebi township near the health center and the office of Local Council I village chairman. As a result, some minor changes were made in the translation of the script into the local language (Luganda) to avoid exclusion. Two research assistants administered the questionnaires face-to-face with the respondents.

The two research assistants who were residents of the two divisions of KCCA collected data from respondents geographically spread throughout the divisions. Arrangements were made with the respective Local council I chairmen to attend village meetings, and support to fill in the questionnaire was given to residents who could neither read nor write, or were not interested in filling the questionnaire, but who were willing to participate in a question answer session. Service quality was measured in five dimensions according to Parasuraman et al. (25) i.e., reliability, tangibility, assurance, empathy and responsiveness.

The limitation of this research was because it was possible to obtain a list of voters from the electoral commission for residents in KCCA. As a result, it was difficult to find individuals to select from randomly. Thus cluster sampling was employed. It was not easy to know the proportion of different inhabitants of KCCA to obtain a stratified sample.

### Analysis

The questionnaire data was coded, entered and analyzed using Statistical Package for Social Science (SPSS) 16.0 software and a chi-squared test was performed to

determine the impact of shared health services on service quality, with a correction to show whether sharing health was predictable of service quality. Hierarchical regression was performed for robustness and to show the impact of sharing health services on service quality as advised by Danny CP et al. (26).

## Results

A total of 723 people were interviewed and asked to participate in this study. All together 446 (64.5%) of the people interviewed consented, and 59.6% were men. See table 2 below.

**Table 2:** Demographic information of sample (N=446)

		n	%
Sex	Male	266	59.6
	Female	180	40.4
Education	Low	70	15.7
	Medium	200	44.8
	High	176	39.5
Age	Young	210	47.2
	Medium	202	45.4
	Old	33	7.4
Marital status	Married	234	52.5
	Single	141	31.6
	Separated	71	15.9
Employment sector	Government	132	29.6
	Private sector	102	22.9
	Self employed	156	35.0
	House wife	56	12.6
Length of stay in the division	Less than 5years	113	25.3
	6-10 years	117	26.2
	11-15 years	130	29.1
	More than 15 years	86	19.3

The table 3 indicated the subcomponent's response rate of service quality. The response rate includes only residents who made responses.

The frequency distribution of the responses for the dimensions under tangibility were 100% for medical equipment, 99.6% for health facilities and 99.3% for medical personnel. Regarding reliability, 99.8% said that the service was provided as promised, 99.6% said that the health centre staff were solving health needs while 99.6%

said that the health centre staff were providing services at the promised time. Regarding responsiveness, 99.8% mentioned the assurance dimension, with the confidence shown by patients, 99.6% of residents said they felt safe, and 99.6% approved of consistency of the health services, while 99.8% said that the staff were courteous. Regarding empathy, the respondents commented on individualized health services (100%), the operating hours (99.1%) and their best interests (100%) with a total of 19 missing values.

**Table 3:** Distribution Response rate for service quality

Dependent Variable	Total number of respondents	Percentage (%)
<b>Tangibility</b>		
Medical equipment	446	100
Health facilities	444	99.6
Medical personnel	443	99.3
<b>Reliability</b>		
providing services as promised	445	99.8



Dependent Variable	Total number of respondents	Percentage (%)
Solving health needs	444	99.6
providing services at the promised Time	444	99.6
<b>Responsiveness</b>		
Prompt medical services	445	99.8
<b>Assurance</b>		
Confidence in patients	444	99.6
Residents feel safe	444	96.6
Consistency and courteous	445	99.8
<b>Empathy</b>		
Individualized health services	446	100
Operating hours	442	99.1
Best interests	446	100

**Impact of shared health services on quality using SERVQUAL**

According to (25), he describes service quality was the difference between customers’ normative anticipations for the service and their observations of service performance. Service quality had been studied in five dimensions that include *reliability, empathy, responsiveness, assurance and tangibility* as shown in Table 4 below.

The study indicated that regarding tangibility, sharing health services significantly determined the number of modern medical equipments (p=0.000) and the number of medical personnel that had a neat and professional

appearance (p=0.000) but not the number of visually appealing health facilities (p=0.386) as shown in Table 4 below.

The study indicated that regarding reliability, sharing health services significantly determined the number of health services provided as promised (p=0.000) and the number of medical services provided at the promised time (p=0.000) as shown in Table 4 below.

The study further revealed that sharing health services had a significant effect on the degree of responsiveness regarding promptness, assurance and empathy in the delivery of the services (p=0.000).

**Table 4:** Impact of sharing health services on quality according to SERVQUAL

Variable	Chi-square value	P-value
<b>Tangibility</b>		
Medical equipment	82.825	0.000
Health facilities	9.576	0.386
Medical personnel	44.928	0.000
<b>Reliability</b>		
providing services as promised	37.065	0.000
Solving health needs and system	10.814	0.289
providing services at the promised Time	232.189	0.000
<b>Responsiveness</b>		
Prompt medical services	204.698	0.000
<b>Assurance</b>		
Confidence in patients	131.858	0.000
Residents feel safe	48.846	0.000

Variable	Chi-square value	P-value
Consistency and courteous	242.381	0.000
<b>Empathy</b>		
Individualized health services	204.698	0.000
Operating hours	155.584	0.000
Best interests and willingness	110.463	0.000

The correlation test in Table 5 indicated a positive and significant relationship between sharing health services and some modern medical equipment ( $\rho=.175^{**}$ ) but a significant negative relationship between sharing health services and the number of medical personnel that had a neat and professional appearance ( $\rho=-.186^{**}$ ).

The relationship between sharing health services and the number of visually appealing health facilities was also positive ( $\rho=.128^{**}$ ) as shown in Table 5. The correlation test in Table 5 indicated a negative and significant relationship between sharing health services and number of health services provided as promised ( $\rho=-.281^{**}$ ), and a significant negative relationship between sharing health services and the number of medical services provided at the promised time ( $\rho=-.456^{**}$ ).

The study further revealed that sharing health services had a significant effect on the degree of responsiveness regarding promptness in delivery of the services ( $p=0.000$ ). The correlation analysis indicated a negative relationship between sharing health services and the promptness in service delivery ( $\rho=-0.004$ ) implying that the more the sharing of the health services, the more was the delay in service delivery.

Regarding assurance in service delivery, the study revealed that sharing health services had a significant effect on patients' confidence and safety and the level of consistency and courteousness of the employees were seen with p values that were less than 0.05 as shown in Table 5 below.

The correlation test in Table 5 showed a positive and significant relationship between sharing and patients' confidence ( $\rho=0.153^{**}$ ) implying that as more people shared services, the more their confidence was increased.

A significant negative relationship was revealed between sharing health services and patients' safety. The study also showed that the level of consistency and courtesy of the employees was reduced as the sharing of health services increased as indicated by a negative correlation coefficient ( $\rho=-0.440^{**}$ ) in Table 5.

Sharing health services also had a significant effect on service empathy. The study revealed that sharing health services significantly affected the individual attention given to patients' operating hours and the best interests of the patients was satisfied as indicated with p-values less than 0.05 in Table 5 below.

The correlation analysis revealed that regarding sharing health services, the attention that was given to an individual patient reduced ( $\rho=-0.57$ ), and also satisfaction of patients' best interests ( $\rho=-0.147$ ).

### **The impact of sharing health services on quality of the services**

Ho: Sharing health services does not have any impact on service quality

Ha: Sharing health services improves service quality.

Service quality, measured in five dimensions as advocated by Parasuraman et al., in reliability, tangibility, assurance, empathy and responsiveness, was found to be improving with sharing of the health services. It was shown in model 1, model 2 and model 3 that sharing health services had a positive effect with  $\beta_1=2.972$ ,  $\beta_2=2.864$  and  $\beta_3=2.901$ ; and had a significant impact on service quality, with all p values are less than 0.05. Therefore, the null hypothesis that the sharing of health services did not have any impact on service quality was rejected. The variables such as respondents' marital status, age, education level and willingness of medical personnel to work, were also found to have a significant positive effect on health service quality as shown in Table 6.

The relationship of health service quality and gender, basic equipment, modern health facilities, effective health systems and promptness in service deliver were found to be negative as shown in Table 6 below.

### **Discussion**

The results suggested that the more healthcare services were shared, the more likely the health services quality would improve. This may imply that sharing could manifest in form of quality improvement. Theorists have argued that sharing services improved quality and this study was in line with past empirical studies. Triplett et al., (27) argued that sharing services reflected in cost advantages as well as well as in higher quality while Oakerson et al., (1) in his study confirmed that shared services led to improve quality services. This study had empirically tested service quality and found that shared services lead to improved quality in health services. These findings were also in line with Bergeron (2000) (28) who stated that one of the characteristics of shared services, was the constant pressure to provide a high quality services. However, in

**Table 5:** Correlation analysis between sharing health services on quality according to Parasuraman

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Spearman's rho	1.000													
1.Shared services	1.000													
2.Medical Equipment	.175(**)	1.000												
3.Health facilities	.128(**)	.262(**)	1.000											
4.Medical personnel	-.186(**)	0.078	-0.066	1.000										
5.providing services as promised	-.281(**)	-0.059	.246(**)	.282(**)	1.000									
6.Solving health needs &system	.100(*)	-.136(**)	-0.006	.428(**)	.260(**)	1.000								
7.providing services at the promised Time	-.456(**)	.160(**)	.296(**)	.160(**)	0.012	-.250(**)	1.000							
8.Prompt medical services	-0.004	.190(**)	0.081	-0.094(*)	-.244(**)	-.314(**)	.451(**)	1.000						
9.Patients' confidence	.153(**)	0.031	-0.068	0.091	.422(**)	.216(**)	-.291(**)	-.220(**)	1.000					
10.patients' safety	-.119(*)	-.137(**)	.209(**)	.292(**)	.219(**)	.165(**)	0.035	-.105(*)	-.168(**)	1.000				
11.Consistency & courteous	-.440(**)	-.149(**)	0.090	0.069	.132(**)	-.264(**)	.534(**)	.181(**)	-.185(**)	.107(*)	1.000			
12.Individualized health services	-.157(**)	0.066	.130(**)	.292(**)	-0.063	.112(*)	.509(**)	.211(**)	0.033	.241(**)	.133(**)	1.000		
13.Operating hours	0.049	.252(**)	.226(**)	-.312(**)	-.122(*)	-.215(**)	.295(**)	.364(**)	0.090	-.151(**)	.120(*)	.325(**)	1.000	
14.Best interests and willingness	.147(**)	.234(**)	.230(**)	-0.068	-0.017	-0.019	.285(**)	.350(**)	-0.011	-0.052	-.138(**)	.275(**)	.531(**)	1.000

\* implies that p value is less than 0.05

**Table 6:** Hierarchical regression analysis between sharing health services and service quality

	Model 1	Model2	Model 3
	B	$\beta$	$\beta$
(Constant)	2.972*	2.864*	2.901*
Sharing health services	0.426*	0.433*	0.420*
Gender	-0.118*	-0.111*	-0.115*
Married status	0.133*	0.136*	0.136*
Age	0.063*	0.064*	0.063*
Education level	0.045*	0.044*	0.046*
Medical equipments	-0.140*	-0.14*	-0.127*
Modern health facilities	-0.368*	-0.382*	-0.389*
Medical personnel	0.045	0.043	-0.429*
Solving health needs	-0.455*	-0.454	-
Prompt medical services	-0.035	-	-
Best interests	0.194*	0.213*	0.212*
R-squared	0.142	0.141	0.138
F-Value	6.170*	6.931*	8.321*

\* implies that p value is less than 0.05

KCCA the model operated well with increased supervision which resulted in improved responsiveness, reliability, care for patients, availability of basic medical equipment, health workers' appearance and increased confidence and safety of residents.

The study had potential limitations. Since KCCA was still new and reorganizing its structures, a better perspective of shared services would be needed in future to draw final conclusions before replication of the model. Shared services are highly dependent on how they are implemented and are therefore not easy to generalize. Rather it is best when they are taken on a case by case basis. A strict Public Health Act affects smooth operations of shared services, and hence there is a need for policy guidance on shared health services.

### Conclusion

This research aimed to assess whether shared health services affected service quality and the applied sharing model. No prior research had been undertaken to evaluate this. This study found that sharing health services among health centers and working together to solve societal health problems, had a significant positive impact on service quality although the standards were far from optimal. The study further revealed that health centers were sharing ambulance services, drugs and medical equipments in order to improve service quality. KCCA should encourage sharing of health services.

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# A CASE OF TWO COMMON CULPRITS CAUSING PULMONARY EMBOLISM

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## ABSTRACT

Pulmonary embolism is the obstruction of the pulmonary artery or its branches, commonly by thrombus or fat. We report an unusual case of double pathology - both pulmonary thromboembolism and fat embolism syndrome in a patient with bilateral femur and bilateral tibia fractures. This highlights the importance of a high index of suspicion of these conditions while managing patients with multiple long bone fractures. Morbidity and mortality can be significantly reduced with prompt and appropriate prevention strategies.

**Keywords:** Pulmonary embolism, fat embolism, thromboembolism

## Introduction

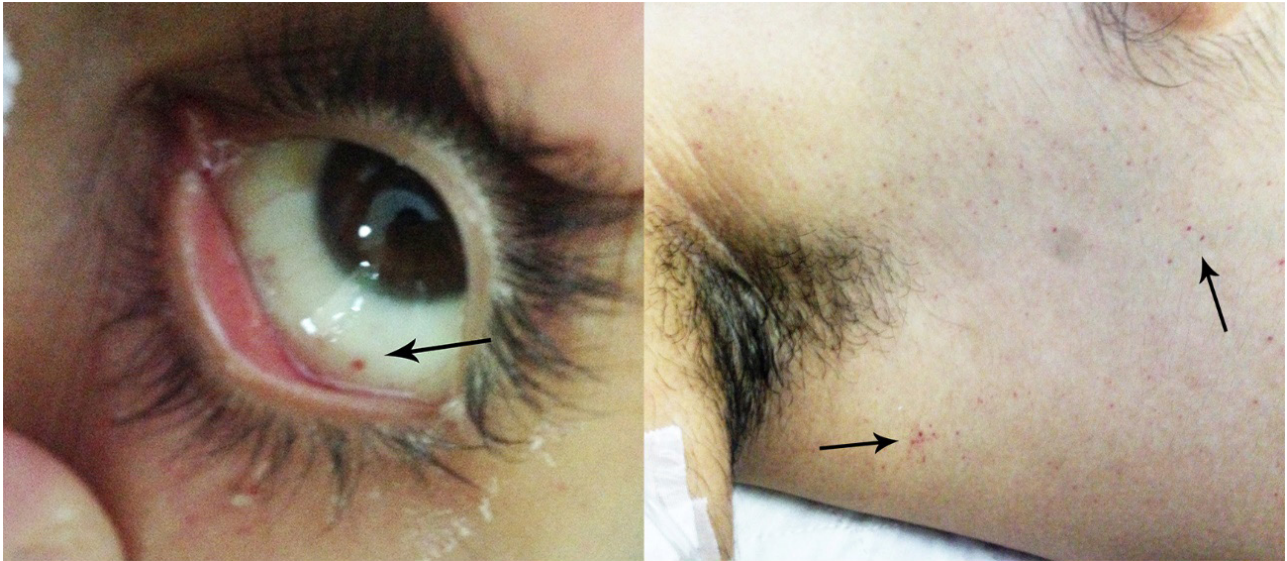
Pulmonary embolism is the obstruction of the pulmonary artery or one of its branches by foreign material, namely thrombus, fat, air or tumour. Fat embolism syndrome refers to the presence of fat globules in the lung parenchyma or microcirculation. It is most commonly associated with pelvic and long bone fractures. The risk of developing fat embolism syndrome increases with the number of long bone fractures, which is up to 33% in patients with bilateral femur fractures (1). Pulmonary thromboembolism denotes the presence of a thrombus within the pulmonary arteries, and its risk factors are based on Virchow's triad, such as prolonged immobilisation, recent surgery, or other causes of hypercoagulability such as malignancy and inherited thrombophilias. We report an unusual case of double pathology, where both pulmonary thromboembolism and fat embolism syndrome were demonstrated in a patient presented with fractures of bilateral femur and tibia.

## Case report

A 21 year-old-man with no significant past medical history was admitted to our hospital 4 hours after a motorcycle accident. He sustained an open fracture (Gustilo Grade II) of the left tibia, open fractures (Gustilo Grade I) of the right femur and tibia, closed fracture of the left femur

and closed fractures of the distal ends of both radii. There were no head, neck, chest or abdominal injuries and he was hemodynamically stable upon admission. He was resuscitated with 3 litres of normal saline and 2 pints of whole blood. Wound debridement and external fixation of both tibias were performed 9 hours after the accident, which was delayed due to prolonged resuscitation. He developed hypotension intraoperatively and became unstable; thus, both femurs were not fixed but put on skeletal traction in the ward.

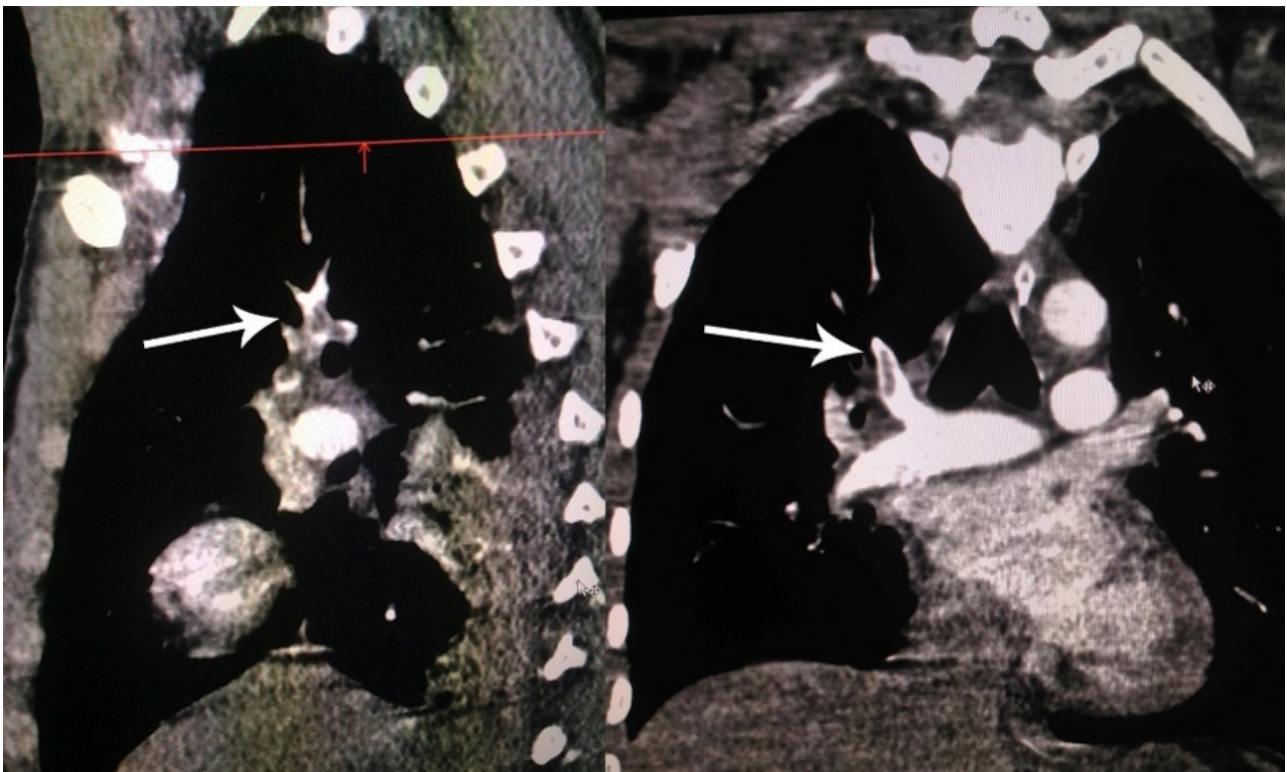
Approximately 42 hours after admission, the patient developed dyspnea with an oxygen saturation of 89% and  $P_aO_2$  of 56 mmHg on 15 L of oxygen per minute via high flow mask. He became drowsy and confused, tachycardic and was febrile with a temperature of 38 degree Celsius. His platelet levels were  $92 \times 10^9/L$ . A diagnosis of fat embolism was made, and he was electively intubated, ventilated and transferred to the intensive care unit for further management. Axillary, truncal and conjunctival petechiae developed 72 hours after admission (Figure 1). His chest radiograph was clear, and he had no electrocardiogram abnormalities besides sinus tachycardia.



**Figure 1:** Images showing axillary, truncal and subconjunctival petechiae

A computed tomography pulmonary angiogram was performed to rule out pulmonary thromboembolism. The results revealed a filling defect within the secondary branches of the left descending, right upper lobe pulmonary artery and tertiary branches of descending right pulmonary artery, which indicated the presence of a thrombus (Figure 2). The patient was started on anticoagulation therapy, comprising of subcutaneous enoxaparin 60 mg twice daily.

Subsequently, his femur fractures were plated, and he was extubated after 8 days in ICU and transferred back to the general ward. Both his tibial fractures were fixed with intramedullary nailing two weeks later. Six months post-trauma, he had no neurological sequelae and he is currently ambulating well with crutches while undergoing rehabilitation.



**Figure 2:** CTPA images showing thrombus in the right upper pulmonary artery (white arrow)

## Discussion

This is an unusual case in which both pulmonary thromboembolism and fat embolism syndrome occurring in the same patient within 72 hours of a traumatic event. Post-traumatic fat embolism was first reported in 1862 (2) and was defined by Gurd and Wilson in 1970 (3). It is widely accepted that medullary fat from fractured long bones is released into the circulation and ends up obstructing the pulmonary vasculature (4). Our patient fulfilled the three major Gurd and Wilson criteria, which include petechial rash, respiratory insufficiency and cerebral involvement. He also had tachycardia, thrombocytopenia and fever, fulfilling another three minor criteria. His symptoms and signs upon presentation scored 11 in Schonfeld's criteria (5) and fulfilled all four of Lindeque's criteria (6) for fat embolism syndrome. Tests such as detection of fat globules in the urine and fluid from bronchoalveolar lavage and magnetic resonance imaging of the brain to look for cerebral fat embolism (7) are not available at our centre. However, the diagnosis of fat embolism syndrome is largely clinical, and symptoms such as petechiae and hypoxemia after a long bone fracture are pathognomonic of the condition.

Pulmonary thromboembolism is a differential diagnosis of fat embolism syndrome, which also presents with tachypnea and tachycardia. The Wells' test score of the patient was 1.5, which indicated a low pre-test probability for pulmonary thromboembolism (8). However, the acute blood loss from four long bone fractures could have caused a hypercoagulable state and contributed to the pulmonary thromboembolism, manifested as dyspnea. D-dimer testing is also not available at our centre. A computed tomography pulmonary angiogram was performed, which revealed the presence of thrombus in the pulmonary artery and confirmed the diagnosis of pulmonary thromboembolism. A lower limb Doppler ultrasound scan was not done in the patient due to multiple fractures and traction devices, but would have supported the diagnosis of pulmonary thromboembolism if positive.

Long bone fractures should ideally be fixed as soon as possible; however, there was a 9-hour delay in this case due to late presentation of the patient and resuscitation at the emergency department. Fat embolism syndrome could have been prevented in this patient if the femur fractures were fixed during the first operation. This would have allowed early mobilisation of the patient and together with earlier initiation of anticoagulation therapy, the occurrence of pulmonary thromboembolism may have been prevented. A lower threshold of suspicion is needed so that preventive strategies would routinely be integrated in the management of patients with multiple long bone fractures.

## Conclusion

Both pulmonary thromboembolism and fat embolism syndrome are potentially fatal, and the presence of respiratory distress in a patient with multiple long bone fractures must not be taken lightly. The treatment

for fat embolism syndrome is essentially supportive, thus, after resuscitation and stabilisation, early fixation must be performed to prevent the occurrence of this condition. A low Wells' score does not rule out pulmonary thromboembolism, and acute blood loss can cause hypercoagulability, which may precipitate a thrombotic event, necessitating the use of computed tomography pulmonary angiogram to confirm the diagnosis (9). Preventive measures such as early mobilisation and anticoagulation therapy should be started as early as permissible. Although rare, the coexistence of fat embolism syndrome and pulmonary thromboembolism in the same patient must be considered, especially in patients with multiple long bone fractures, to ensure appropriate management of patients and prevent morbidity and mortality.

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# CASE REPORT: MASSIVE RUPTURED MALIGNANT PHYLLODES TUMOUR

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## **ABSTRACT**

*Phyllodes tumour is a rare entity, affecting mainly middle aged women. It consists of a spectrum of disease from benign tumour to highly aggressive malignant form. We present a case of massive ruptured malignant Phyllodes tumour, and its subsequent management.*

**Keywords:** *Breast, palliative care, Phyllodes tumour*

## **Introduction**

Phyllodes tumors, or cystosarcoma phyllodes, are fibroepithelial tumours of the breast. It is a rare entity, accounting for an estimated 0.3-0.9% of all breast tumours (1). Its incidence peaks at the 4th decade of life (1). Histologically, phyllodes tumours have both an epithelial component and mesenchymal (stromal) components, and can be classified into benign, borderline or malignant subtypes (2). Surgery remains the preferred modality of treatment in patients with malignant phyllodes tumour and complete R0 resection offers high rates of local control (3). We present a case of a massive right breast sarcoma with rib and pleural metastasis and its subsequent management, which required staged surgeries that ultimately resulted in improved quality of life.

## **Case report**

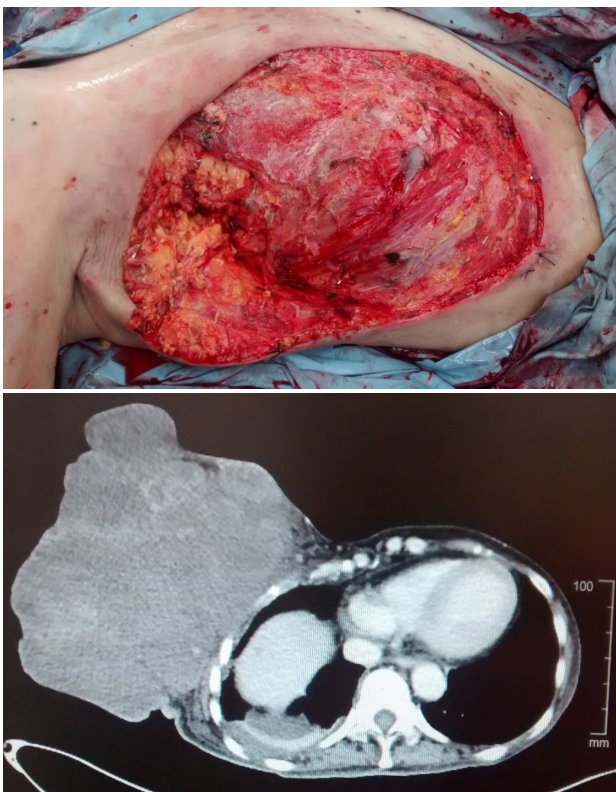
A 58-year-old Chinese lady presented to our Plastic Surgery clinic with a complaint of a right breast lump for the past one year. Despite being aware of it, she did not seek medical treatment till the tumour impedes her movements, ruptured and became unbearably foul smelling for the past two months. Her right arm is kept in a fixed, abducted position with minimal mobility of the right shoulder as a result of the massive breast tumour. She is menopausal for 10 years, married with one child. Family history was unremarkable, and there was no history of psychiatric illnesses. On examination, she appeared severely cachectic,

with a body mass index of 16.3 kg/m<sup>2</sup>. There was a huge fungating right breast tumor extending from the clavicle to the umbilicus level, with extensive skin involvement till the right nipple is not discernable. Multiple areas of foul smelling pus discharge were also seen (Figures 1a and 1b). The tumour is also fixed to the chest wall. There were no clinically palpable lymph nodes. Computed tomography (CT) of the thorax and abdomen revealed a large tumour (Figure 2b) with extension to the rib and pleura. Her core biopsy result was inconclusive.

She underwent a right toilet mastectomy with the aim of palliative care. The tumour was dissected off the right 6th rib en bloc with the pectoralis major muscle (Figure 2a). The underlying wound was too large to be closed primarily. Histopathological examination revealed a 6.0 kg malignant phyllodes tumour measuring 40 cm x 38 cm x 16 cm. All margins were involved, Ki67 proliferation index was 20-30%. Post-operative positron emission tomography (PET) scan noted tumour infiltrating the 5<sup>th</sup> and 6<sup>th</sup> ribs, but no distant site uptake. After one month of admission for wound management, physiotherapy and nutritional support, she was discharged home with a much-improved quality of life. She was able to ambulate, carry out simple chores, was independent in her daily activities and her family were able to accompany her without the foul smelling fungating tumour. Six weeks later, she was readmitted due to pleural effusion and subsequently expired due to pulmonary complications.



**Figure 1a and 1b:** Lateral and anterior views of the large fungating right breast tumour



**Figure 2a:** Right chest wall wound after toilet mastectomy

**Figure 2b:** Selected Computed Tomography image showing a large tumor with rib and pleural involvement (blue arrow)

**Discussion**

Phyllodes tumours are rare breast tumours, which classically presents as a painless, firm, mobile and multiloculated breast lump which rapidly expands. Tumour rupture (4), nipple discharge and skin ulcerations are rare presentations (5). Axillary lymph nodes are only palpable in 20% of cases, but lymph node involvement of phyllodes tumor is rarely seen. Histologically, phyllodes tumours is characterised by epithelial lined cleft-like spaces with a hypercellular stroma, organised into leaf-like fronds. World Health Organization further classifies Phyllodes tumour into benign, intermediate, or malignant tumour based on the tumour margins, stroma cellularity, mitotic rate and pleomorphism. The lungs are the most common site for tumour metastasis. Liver, bone and distant lymph nodes are the other frequent sites of metastasis (6). The overall rate of all phyllodes tumour metastasis is reported as 4% (7).

Currently, there are no gold standard investigation for phyllodes tumour, as ultrasonographic and mammographic images have low sensitivity for differentiating phyllodes tumours and fibroadenomas (8).

The standard treatment for phyllodes tumour is a wide excision with margins of normal tissue greater than 1.0 cm. In cases of high tumour-to-breast ratios or recurrent tumours, mastectomy is recommended (9). There are still controversies with regards to adjuvant chemotherapy and radiotherapy in the post-operative management of malignant phyllodes tumours and is only used on selected cases after multidisciplinary assessments. In our case, a curative resection would include mastectomy, multiple rib resections and plurectomy. However, the patient was not optimised for such an extensive resection, and was only fit for palliative resection with the aim of quality of life improvements.

Most surgeons would not consider performing palliative surgery on such patients because the surgery would not change their prognosis or survival rate. Nevertheless, such palliative therapies would improve the patient’s psychosocial well-being, provide dignity and encourage family support in their short remaining life.

In conclusion, malignant phyllodes tumours, being rare fibroepithelial breast tumours, warrant the clinician to maintain a high index of suspicion if a patient presents with a rapidly enlarging breast lump. A simple palliative mastectomy should be performed if negative margins are not achievable by wide local excision to improve their quality of life. Adjuvant therapy is considered in individual patients.

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