




*SURGICAL TREATMENT OF OBESITY IN
RENAL PATIENTS*



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There are no disclosures.

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- General comments about morbid obesity
 - Paradoxical effect in dialysis patients
 - Effect of morbid obesity on transplant outcome
 - Cincinnati experience
 - Related studies

MORBID OBESITY

- Definition: BMI ≥ 40 or ≥ 35 with co-morbid conditions
- Incidence: About 5% of adult population (15 million)
 - 7.4% of dialysis patients have a BMI ≥ 40 (ESRD data)
- Mortality:
 - > 300,000 deaths/yr
 - At age 30, 15-20 years of life lost
 - Death rate 2-10X compared to normal weight
- Morbidity:
 - Second leading cause of burden of disease in USA after tobacco use
 - Metabolic syndrome, arthritis
- Economic Burden: \$117 billion per year
 - About 1/2 direct costs
 - About 1/2 of patients on public assistance

COMPLICATIONS OF OBESITY

- Neurologic - Pseudotumor cerebri
- Pulmonary - Sleep apnea, hypoventilation syndrome, asthma
- Cardiac - CAD, hypertension, CHF
- Urinary - Incontinence, stones, progression of renal disease
- Metabolic - Diabetes, hyperparathyroidism, hyperlipidemia
- Metabolic syndrome - Insulin resistance, dyslipidemia, hypertension, central obesity
- Musculoskeletal - Arthritis/ joint pain
- Increased incidence of malignancies, especially breast, uterus, colon, prostate
- GI - GERD, bowel dysfunction
- Psychiatric - Depression

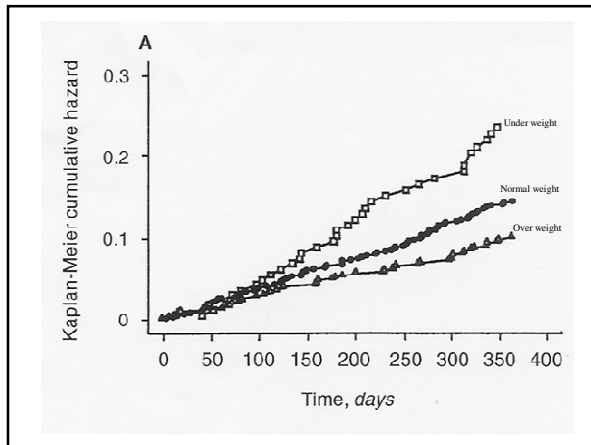
BENEFITS OF BARIATRIC SURGERY

- Weight loss
- Reduction or complete resolution of co-morbid conditions (> 90%)
 - Cardiac risk
 - Diabetes 64-100% (median 100%), immediate response
 - Hypertension 25-100% (median 89%)
 - Dyslipidemia 60-100% (median 88%)
 - Reversal of congestive heart failure
 - Arthritis and mobility
 - Pulmonary - COPD, asthma
- Increased social and personal acceptance after discrimination
- Mortality - Decreased by 25-89% by 5 years with bariatric surgery. In diabetic patients, GBP reduces yearly death rate from 4.5% to 1.0%
- Allows performance of beneficial operations (e.g. transplant, knee replacement)

THE PARADOXICAL EFFECT OF OBESITY IN DIALYSIS PATIENTS (REVERSE EPIDEMIOLOGY)

- 1346 dialysis patients in limited care facilities
 - 8.5% mortality at 12 mo
 - One year mortality less (RR 0.7) in obese patients (BMI > 27.5), but only 3 patients BMI > 45

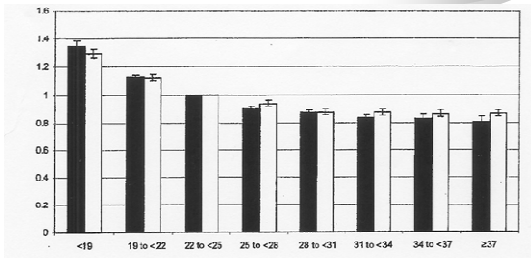
Fleischmann E et al, *Kidney International* 55:1560, 1999



Johansen KL et al, Am J Clin Nutr 80:324, 2004

- 418,055 patients starting dialysis, 2 year follow-up
- 8 categories BMI Highest ≥ 37
- High BMI associated with better survival

Johansen KL et al, Am J Clin Nutr 80:324, 2004



HOWEVER...

- 376 patients – Advanced renal failure not on dialysis
 - Survival worse in patients BMI > 30
Caravaca et al, Nefrologia, 2004
- In a study in the Netherlands involving 772 dialysis patients aged 50-75, no reverse epidemiology could be found.
Mutert et al, J Am Soc Nephrol, 2007

EFFECTS OF OBESITY ON OUTCOME AFTER TRANSPLANT

- Wound infection and healing impaired with BMI > 35.
- Relative risk of death-censored graft loss, cardiovascular death and infectious death all between 1.4 and 1.8 with BMI > 36.
- Survival at 5 yrs 89% BMI < 30 vs 67% BMI > 30.
- Cardiac disease primary cause of death in obese transplant patients.
- Obesity associated with proteinuria progression.
- Not all studies show worse outcome in obese transplant patients. May reflect patient selection.
- Most centers deny access of patients with BMI > 35.

**OBESITY IMPACTS ACCESS TO KIDNEY
TRANSPLANTATION**

Segev DL et al, J Am Soc Nephrol 12/19/2007

Data from UNOS 132,353 patients (1995-2006)

BMI	Time to Tx	Likelihood of Tx
25-30 (34.3%)	40 mo	↓ 2-4%
30-35 (19.3%)	42 mo	↓ 2-7%
35-40 (7.2%)	51 mo	↓ 24-28%
>40 (2.7%*)	59 mo	↓ 42-44%

*compared to 7.4% of dialysis patients

THE BIG QUESTION

How often should GBP be done in patients with CRF or renal transplant?

BACKGROUND

- Chronic renal disease (CRD) is common in patients with obesity
- Many bariatric centers will not perform gastric bypass (GBP) in patients with CRD

UC EXPERIENCE

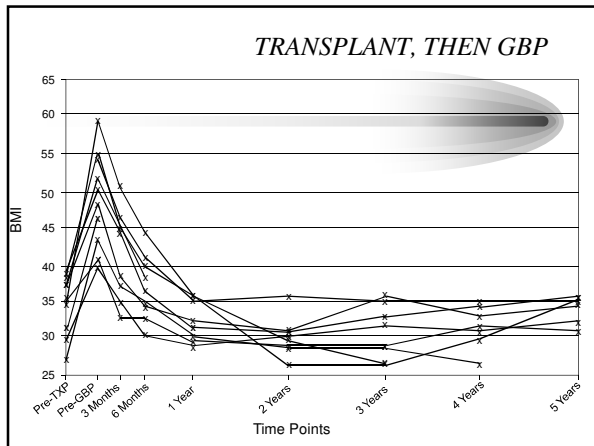
- Of 59 patients
 - 10 had gastric bypass after transplantation
 - 18 were on dialysis
 - 14 went on to transplant
 - 8 had miscellaneous problems with renal disease
 - 9 had stabilization or improvement of CRD

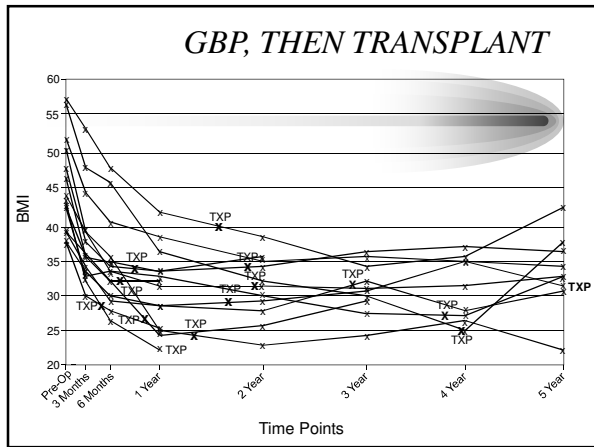
DEMOGRAPHICS

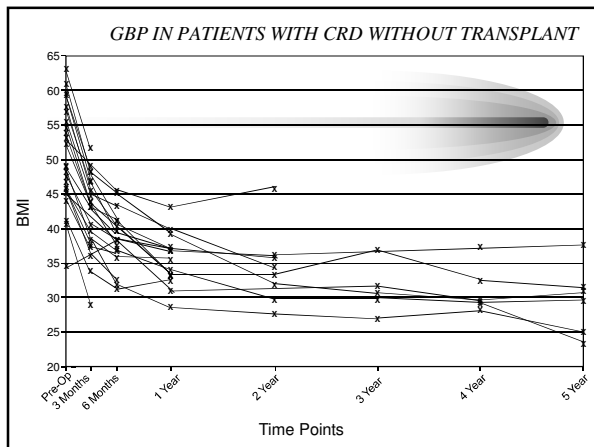
GBP Dates 3/16/1997 – 9/30/2008

		Age at GBP	BMI	On dialysis at GBP	LOS
Group I	TX→GBP	43.9±3.4	48.8±1.9	0/10	5.6±1.0
Group II	a. GBP→TX	44.9±3.9	45.4±1.7	10/14	5.4±1.0
	b. Improved	43.0±4.3	49.0±1.8	2/9	3.8±0.6
	c. GBP no TX	45.9±2.5	51.3±1.6	19/23	6.4±1.7
	d. No CRF	45.2±13.3	48.7±12.3	0/3	2.3±0.3

- All open procedures
- There were no:
 - 30 day mortalities
 - Primary deep wound infections
 - Splenic injuries
 - Transfusions







USRDS ANALYSIS BS IN CFR

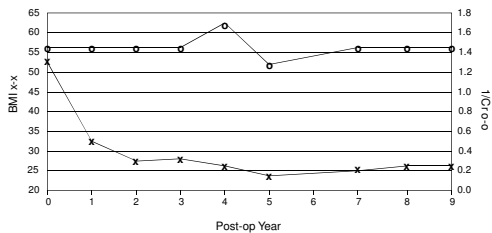
Modulou et al, Transplantation, 2009

- 188 cases
 - 72 prelisting
 - 29 on wait list
 - 87 posttransplant
- Median excess body weight loss 31-61%
- 30 day mortality 3.5%

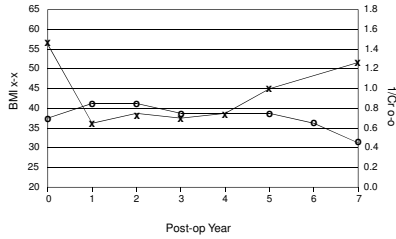
UC EXPERIENCE

- 9 of 49 non transplant patients had resolution, improvement or stabilization of their CRD
- Age 43.0 ± 4.3 , BMI 49.0 ± 1.8
 - 5 had FSGS
 - 2 had membranous glomerulonephritis
 - 2 had diabetic nephropathy
- Four examples are given

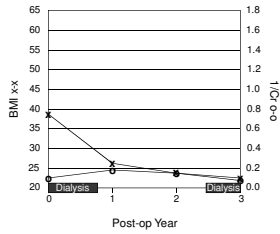
Patient 1: 42-year-old female. Heavy proteinuria with diagnosis of membranous glomerulonephritis by biopsy in 1997. Treated with steroids for 6 months without resolution. GBP 8/26/1999. Urine protein >300mg/dL at bypass and dropped to 297mg/24h by one year and negative thereafter. She has been stable without evidence of recurrence for 9 years.



Patient 2: 36-year-old female with diagnosis of FSGS. Urine protein >15g/24h Dec. 1999 and 8.5g/24h April 2000. GBP 6/27/2000. Urine protein dropped to 2.9g/24h at 1 year and 2.2g/24h at 2 years. By 5 years it had increased to 5.5g/24h and by 7 years to 8.3g/24h. Note that renal function deteriorates with regain of weight after 4 years.



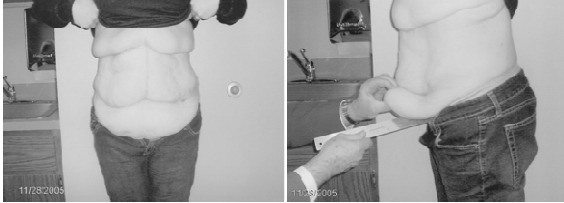
Patient 3: 25-year-old female with of FSGS. Started hemodialysis 2/3/2004. Urine protein 4.9g/24h. GBP 11/26/2004. Taken off dialysis 5/23/2005, urine protein 2.6g/24h. Restarted dialysis (PD) 8/30/2007, urine protein 100mg/dL.



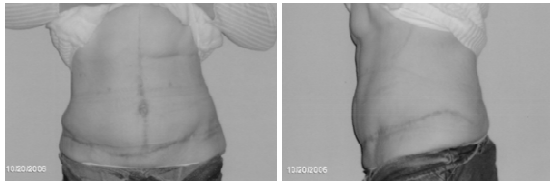
Pre-GBP Surgery



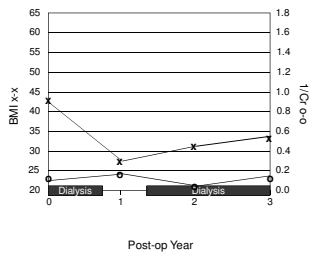
Pre - Abdominoplasty



295 Days Post Abdominoplasty



Patient 4: 61-year-old male with FSGS. Started planned dialysis at time of GBP 8/16/2005. Dialyzed for 6.5 months, then stopped for 7 months and resumed dialysis 11/30/2006.



*IMPROVEMENT OF KIDNEY FUNCTION
AFTER BARIATRIC SURGERY*

- Soto FC et al *Obes Surg* 2005
 - Resolution of CRF after LGBP
- Fowler SM et al *Pediatric Nephrol* 2009
 - 17 year old female resolution of FGS after LGBP
- Taffi BA et al *Obes Surg* 2009
 - Resolution of CRF after GBP – single patient
- Navaneethan and Yehnert *SORD* 2009

25 patients	BMI	GFR
Before GBP	49.8	47.9
After GBP (1 yr)	34.5	61.6

*ASSOCIATION BETWEEN
OBESITY AND CKD*

Hsu CY et al, Ann Intern Med, 2006

- Kaiser Permanenti Health Plan
 - > 300,000 patients, 8,343,955 person years 1964-1985
 - 1476 cases of ESRD occurred
 - BMI < 25 Reference
 - BMI 25-29.9 RR 1.87
 - BMI > 40 RR 7.07

DISCUSSION

- Proteinuria and CRD are associated with obesity
 - Causes:
 - Hyperfiltration
 - Hyperlipidemia
 - Increased venous pressure
 - Increased vasoactive and fibrogenic substances
 - Insulin, leptin, IGF β_2 , angiotensin II
 - Obesity related FSGS
 - Albumin excretion \uparrow by 89% in obese patients

**TYPES OF SURGICAL WEIGHT
LOSS**

- Adjustable gastric banding
- Gastric bypass
- Sleeve gastrectomy
- Biliopancreatic diversion

SLEEVE GASTRECTOMY

MacLaughlin HL et al Obes Surg online 5/25/11

- 9 patients with CKD (5 with HD) underwent LSG
- No mortality – one patient had gastric leak at 7 months
- Median decrease in excess BMI at 6 months = 49.2%

SLEEVE GASTRECTOMY

Szomstein S. Obes Surg (2010) 20:383-395

- 5 morbidly obese patients after renal transplant
- 4 underwent LRGP, 1 had LSG

CONCLUSIONS

- Bariatric surgery in patients with CRF/Tx has acceptable early morbidity/mortality
- Deaths are associated primarily with cardiovascular conditions and not the surgical procedure.
- Bariatric surgery can cause improvement or stabilization of CRF
- Bariatric surgery can make ineligible patients eligible for transplant
- The indications for bariatric surgery in CRF/Tx patients should be the same as for the general population
- The best operation is probably laparoscopic sleeve gastrectomy (banded?)

QUESTIONS?
