CATARACT EXTRACTION WITH INTRAOCULAR LENS IMPLANT: EARLY EXPERIENCE IN UNIVERSITY OF NIGERIA TEACHING HOSPITAL (U.N.T.H.), ENUGU, SOUTH-EASTERN NIGERIA

By
CHUKA-OKOSA CM, EZE BI AND EZEPUE UF
Department of Ophthalmology, University of Nigeria Teaching Hospital (U.N.T.H.), Enugu.

SUMMARY

Objectives: To audit our early experience of cataract surgery with intraocular lens implant, in the University of Nigeria Teaching Hospital (U.N.T.H.), Enugu.

Methods: In a retrospective, non-comparative case-series study, the records of all patients who had cataract extraction with intraocular lens implant between January 2001 and October 2002 and were followed up for at least eight weeks were analyzed.

Information on age, sex, type of cataract, co-existing ocular and systemic disease, pre- and postoperative visual acuity and postoperative complications was collected.

Results: Forty four eyes of 40 patients were studied; mean age of the patients was 52.2 years (range: 8-87 years).

Thirty seven eyes had age-related (senile) cataract; 2 post-uveitis cataract and 5 traumatic cataract. Associated systemic diseases were diabetes mellitus (4); hypertension (4); asthma (1); rheumatism (1) and diabetes and hypertension (1).

Preoperative visual acuity was </=CF in all the patients.

Eight weeks post-surgery 14 eyes had no data on presenting (uncorrected) visual acuity while 9 had presenting visual acuity of >/=6/18. With refraction those with visual acuity of >/= 6/18 increased to 14 out of the 18 who had refraction (77.8%).

Cause of persistent poor visual acuity was ascertained in only 1 eye and was endophthalmitis. Postoperative complications included corneal oedema/striae (91%); astigmatism (18.2%); poor wound apposition (18.2%) and endophthalmitis (2.3%).

Conclusion: The final visual outcome in 77.8% of patients who had refraction post-surgery was good (>/= 6/18.) confirming that Cataract surgery with IOL implant is safe and effective in restoring vision to the cataract blind in this part of the world.

Most of the cases of postoperative astigmatism were corrected with refraction.

Keywords: *cataract extraction; intraocular lens implant*

INTRODUCTION

Cataract is the leading cause of bilateral blindness worldwide[1] accounting for 50% of all blindness[2]. The prevalence of cataract blindness is on the increase due to global population growth and increased longevity resulting from improved medicare[1]. In various studies in Nigeria[3-6], cataract has remained the leading cause of blindness. Faal and coworkers,[7] in a national survey of blindness in the Gambia found that cataract accounts for 45% of blindness and 57% of low vision.

Incident cataract blindness is also on the increase because the cataract surgical rate lags behind the incidence of operable cataract blindness. However, other social, economic and cultural factors affect the cataract surgical uptake even when the services are available [8,11].

The definitive treatment for cataract blindness is surgery. As yet, there is no known efficacious medical therapy that can retard the progression or cure fully developed cataract [12]. Surgical intervention for vision restoration in cataract has been practiced by orthodox and

Correspondence Author:
Dr. Chimdi Chuka-Okosa, Department Of Ophthalmology UNTH, Enugu. E-mail: chimdi_8691@yahoo.com
Accepted for Publication: 17th September 2003

traditional eye care providers since ages. Couching is the usual surgical approach used by traditional healers and it is associated with high risk of complications and eventual poor visual outcome. [13]

Orthodox cataract extraction has evolved through intracapsular cataract extraction (ICCE), extracapsular cataract extraction (ECCE); cataract extraction with lens implantation; phacoemulsification and most recently Dodick photolysis which applies laser for cataract surgery [14-16].

Intraocular lens implant for correction of surgical aphakia could be anterior chamber intraocular lens (ACIOL), posterior chamber intraocular lens (PCIOL) or scleral-fixed intraocular lens. Choice of implant (IOL) type and implantation technique depend on patient factors, surgeon's experience and preference and availability of appropriate equipment and consumables. The visual outcome is graded after full spectacle correction into the following categories by WHO: Good outcome: 6/6 - 6/18; borderline outcome: < 6/18 - 6/60 and poor outcome: < 6/60 [16].

Extracapsular cataract extraction with intraocular lens implant has been the method of cataract surgery in U.N.T.H., Enugu since 2001. The objective of this study is to do an audit of the initial cataract surgeries with intraocular lens implant done at U.N.T.H., Enugu, with regards to visual outcome with and without refraction eight weeks post-surgery and the associated ocular complications.

PATIENTS AND METHODS

We retrospectively studied all the 40 patients who had cataract extraction with intraocular lens implant between January 2001 and October 2002. They were all followed up for a minimum of eight weeks postoperatively.

Data relating to age, sex, types of cataract, co-existing ocular and systemic disease; pre- and postoperative visual acuity and postoperative complications were collected. Histories of cough, constipation, bladder outlet obstruction were sought for as appropriate for patient's sex and age.

Preoperative evaluation of each patient included visual acuity measurement using the Snellen's Chart; light projection test; tonometry using the Goldman applanation tonometer; fundoscopy through dilated pupils using the direct ophthalmoscope; slit-lamp biomicroscopy; systemic blood pressure measurement and urinalysis.

Biometric pre-operative determination of required intraocular lens (IOL) power was not done.

Each patient was admitted at least 24 hours before surgery. Pre-operative medications included tabs Acetazolamide 500mg the night before surgery repeated on the morning of surgery; guttae chloramphenicol or Gentamicin. When necessary some patient received either bromazepam 3mg or diazepam 10mg tablet the night before surgery to allay anxiety. Pupillary dilatation was achieved with either guttae cyclopentolate 1% or tropicamide or phenylephrine 2.5%.

Anaesthesia was local in all but two patients. Routes of administration were retrobulbar and facial nerve block using either plain xylocaine 2% or xylocaine 2% mixed with bupivacaine 0.5%. The addition of hyaluronidase was optional.

Two very young patients had their cataract surgery under general anaesthesia.

All the operations were performed using the SO 111 standard operating microscope with co-axial illumination and zoom magnification (Scanoptics Adelaide Australia).

The standard procedure for extracapsular cataract extraction was followed. However, while five eyes had corneal section the rest had limbal section. The anterior capsulotomy was done using the can-opener technique in 17 eyes and Fred Hollows Foundation technique in the rest. In the former, IOL was inserted under a visco-elastic and under air in the latter.

Miochol is not available in the centre and therefore, was not used. Where constriction of the pupil was required intraoperatively guttae Pilocarpine 4% was used. Irrigation was with normal saline.

The limbal or corneal incision was closed either with continuous or interrupted 9/0 nylon.

After surgery sub-conjunctival gentamicin 20mg and dexamethasone 2mg were given; topical antibiotics (Gentamicin or chloramphenicol) and steroids (dexamethasone or betamethasone) were instilled before the eye was padded. The eye was usually left undisturbed until the next day.

Postoperative medications included topical antibiotics administered 6 hourly; 2 hourly topical steroids for 48 hours then 6 hourly for the next 8 weeks and steroid-antibiotic eye ointment at night. The use of Non-steroidal anti-inflammatory agents (NSAIDS) and analgesics postoperatively was dependent on surgeon. The surgeons who used NSAIDs used piroxicam. Some surgeons do not routinely give pain-relievers postoperatively. Where a patient complained of some form of discomfort such surgeons placed the patient on paracetamol tablets as required.

On each postoperative day, each patient had a detailed evaluation which included visual acuity measurement using the Snellen's; slit-lamp biomicroscopy assessing wound apposition, corneal clarity, depth of and activity in anterior chamber, shape and size of pupil and positioning of IOL; and fundoscopy using the direct ophthalmoscope. Discharge was usually on the 2^{nd} to 4^{th} postoperative day in uncomplicated cases.

After discharge, patients were seen 2 weeks later and thereafter followed-up every 3 weeks. On the 8th week post-surgery they were refracted and discharged from the clinic. However, in the presence of any postoperative complication they were seen more frequently.

RESULTS

A total of 44 eyes of 40 patients had cataract surgery with intraocular lens implant during the study period. Follow-up of all the patients was for at least 8 weeks.

Twenty three (57.5%) were females while 17(43.5%) were males (M: F=1:1.35). The age range was 8-87 years with a mean of 52.2 years. The pre-op visual acuity in all the patients was </= counting fingers (CF).

Of the 44 eyes, 37 (84.0%) had age-related (senile) cataract, 2 (4.6%), post-uveitis cataract and 5 (11.4%), traumatic cataracts. Four patients had bilateral cataract extraction. A +21.0D posterior chamber intraocular lens (PCIOL) was implanted in each of 42 (95.4%) eyes and a +18.0D anterior chamber intraocular lens (ACIOL) in each of the 2 (4.6%) other eyes. Primary ACIOL implantation was resorted to following large posterior capsular tear with vitreous loss during extracapsular cataract extraction.

TABLE 1: ASSOCIATED SYSTEMIC DISEASES IN THE PATIENTS

Associated Disease	Number Of Patients	(%) Of Total Patients
Diabetes Mellitus	4	10.0
Hypertension	4	10.0
Asthma	1	2.5
Rheumatism	1	2.5
Both Diabetes And Hypertension	1	2.5
No Data	29	72.5
TOTAL	44	100.0

Coexisting systemic disease was documented in eleven patients. The commonest coexisting systemic diseases were hypertension and diabetes (table1) Only 5 eyes were recorded to have co-existing ocular morbidities and these were glaucomatous optic atrophy (3 eyes) and old uveitis (2 eyes)

TABLE 2: PRE- AND POST-REFRACTION VISUAL ACUITY FOLLOWING CATARACT SURGERY WITH IOL IMPLANT

Visual Acuity	Pre-Refraction: Postoperative Day / Number Of Eyes*				Post-refraction
	1st	2nd	2 Weeks	8 Weeks	
6/6- 6/18	6 (13.6)	3 (6.8)	2 (4.55)	9 (20.5)	14 (31.8)
<6/18- 6/60	8 (18.2)	16 (36.4)	13 29.55	17 (38.6)	3 (6.8)
< 6/60	27 (61.4)	21 (47.7)	5 (11.35)	4 (9.1)	1 (2.3)
No Data	3 (6.8)	4 (9.1)	24 (54.55)	14 (31.8)	26 (59.1)
TOTAL	44 (100.0)	44 (100.0)	44 (100.0)	44 (100.0)	44 (100.0)

*Figures in parenthesis are percentages

Post-operatively, the uncorrected visual acuity steadily improved over time (table 2). Refraction further improved the visual outcome. Only one of the 18 eyes that were refracted had a corrected visual acuity of < 6/60. Twenty six eyes had no postoperative refraction data.

The only intraoperative complication in this series was posterior capsular rent. The commonest postoperative complication (table 3) was corneal oedema/striae (91%).

TABLE 3: POSTOPERATIVE COMPLICATIONS

Time of Presentation	Complication[a]	Number of Patients	%
Early (< 1 Week):	Corneal Oedema/Striae	40	91.0%
	Poor Wound Apposition	8	18.2
	Hyphaema	1	2.3
	Iris Tuck	1	2.3
	Irregular Pupil	1	2.3
Late (>1 Week)	Postoperative Astigmatism[b]	8	18.2
	Raised Intraocular Pressure	2	4.6
	Conjunctival Discharge	1	2.3
	Endophthalmitis	1	2.3
	Uveal Prolapse	1	2.3
	Wound Gape	1	2.3

[a] Some Eyes had more than one complication

[b] Postoperative astigmatism was of the order of +2.0 to -4.0D and all but one was regular

DISCUSSION

Cataract extraction with intraocular lens implant is a relatively new technique in tropical Africa compared with Europe and America where it has been the standard for many decades[14]. The local experience with IOL implantation surgery is yet unfolding with only six reported case-series in Nigeria.[18-23]. The present study of 40 patients is the fourth largest case series reported locally. Bekibele[23] had 61 patients, Agbeja[18] 51 and Adejor[21] 46. This is in sharp contrast with the size of case-series reported in developed countries[24]. Inadequacy of surgical manpower, lack of awareness, fear and cost of surgery are established barriers to high cataract surgical uptake and output in third world countries[3].

The age range of our patients of 8-87 years is comparable with that reported by Nwosu[22] and Bekibele [23] but differed from that in studies by Agbeja[18] and Adejor[21] whose patients were younger. However, this study recorded the youngest age to receive 10L locally (8 years), younger than that reported in Nwosu's case-series[22] (9 years). At the inception of IOL therapy, the very young eyes were listed as unsuitable for this form of treatment but these days young age is no longer a barrier to 10L implantation[25]. As expected, though, the elderly (50 years and above) who are universally more at risk of cataract, constituted the bulk (65%) of the patients in our series.

There were more female patients in our series: M: F = 1:1.35. Nwosu[22] and Adejor[21] made similar observations. Mckellar et al[24], in a large series of 1000 patients, found that 64.2% were females with 94.2% of the patients aged above 60 years. Bekibele [20] found same sex and

age distribution as in our series. This is probably because there are more women of that age group in the Nigerian population. It is also possible that the women have a better health service seeking habit and are easier to convince to accept eye surgery than the men.

However, Dawodu et al[19] observed a sex ratio M: F = 3:2 with mean age of 57.9 ± 14.29 years. Associated systemic disease was present in 11 (25.1%) patients in our series compared with 53.3% reported by Nwosu in an Onitsha study[22]. Such diseases do not seem to have affected the surgical outcome in our patients.

Nwosu[22] recorded co-existing chorioretinal scar involving the macula(3eyes); pre-existing corneal opacity (2eyes) and diabetic retinopathy (1 eye); while Dawodu et al[19] recorded cases of macula degeneration(3), disc pallor(1), hypertensive retinopathy (1), diabetic retinopathy(3) and chorioretinal scar among others.

Co-existing ocular diseases could explain the persistent reduced postoperative visual acuity in some of the patients. It is therefore necessary to screen for them preoperatively in order to ensure adequate patient counseling and prognostication.

Preoperative visual acuity was ≤ CF in all our patients compared with </= 6/36 in Nwosu's series[22] and </= 6/24 in the Kaduna[21] report. Dawodu et al[19] however reported a similar pattern of pre-operative visual acuity of </= CF in all their patients.

In our institution only those actually blinded by cataracts (V/A <3/60) are offered cataract surgery with IOL implant.

Postoperatively, presenting visual acuity postoperatively steadily improved over time. This is similar to the findings in other studies[18-22]. Refraction made this even better. If all calculations are based on the total number of eyes with available data only, then 30% of such eyes had uncorrected visual acuity of >/= 6/18 at 8/52 postoperatively, while 77.8% had postoperative corrected visual acuity of >/=6/18. Agbeja[18] reported uncorrected and corrected visual acuity of >/=6/9 in 14% and 35.3% of her patients respectively; Bekibele[23] 9.8% and 36.1%. While Adejor[21] reported that 16.7% had uncorrected visual acuity of >/=6/12 Nwosu[22] reported 26.6% using the same cut-off visual acuity at the 8th postoperative week.

The visual acuity findings in these studies may not be compared with those in our series because of the differences in the cut-off values for visual acuity and the duration of follow-up.

In Nepal[26], at the 8th postoperative week 54.4% of patients had uncorrected visual acuity of >/= 6/18 while 87.1% had corrected visual acuity of >/= 6/18. Bekibele[23] reported 50% of corrected visual acuity of >/= 6/18.

In some other studies corrected postoperative visual outcome were recorded in ways similar and comparable to ours. These include V/A >/= 6/18 (Madurai[27]-98.1%; Nepal[28-29]-91.5%; Ago-Iwoye[23]-50%); V/A <6/60 (Madurai[27]- 0.6%;Nepal[28-29]-1.2%).

The better results observed in the Madurai and Nepal studies as compared to those in our series could be due to surgeon's experience, better surgical skills, better patient selection and availability of equipment for pre-operative biometry which enabled the surgeons implant IOL of relatively more accurate power. Our centre has no equipment for preoperative biometry.

Generally, however, reduced visual acuity even after refraction resulted from either surgical complication or pre-existing ocular diseases in those of our cases where data was available.

Twenty six (59.1%) eyes had no refraction data in our series. This percentage of refraction non-coverage is higher than the 30% in a Benin study[19] and 14.3% in an Ago-Iwoye series[23].

It was not possible to ascertain the reasons for this unavailability of refractive data. From our experience however, the reasons could include patient default from follow-up because of satisfaction with the visual outcome after surgery.

Contrarily, Nwosu[22] reported refraction coverage of 100% in Onitsha study which he

attributed to excellent patient commitment to follow-up following adequate motivation.

The intraoperative complication of posterior capsular rent and vitreous loss occurred in 2 eyes (4.5%).This complication necessitated the use of ACIOL. This finding is similar to that by other workers (Nwosu[22] 4.9%; Bekibele[23] 4.9%).

Posterior capsular rent occurred in 14% and 2% of Kaduna[21] and Ibadan[18] patients respectively.

In Nepal[26], only a case of posterior capsular tear with vitreous loss was reported out of 207 cataract extractions with IOL.

Postoperative astigmatism was the second most common complication in our series as it also was in Nwosu's[22] although the latter author appeared to have had more postoperative astigmatism (34.1%). Post-operative astigmatism following extracapsular cataract extraction with posterior chamber IOL implant is often due to suturing technique and tilting of the IOL secondary to one haptic being in the capsule bag while the other is in the sulcus. Although Bekibele[23] reported that in spite of the postoperative refraction, 5 out of 7 of his patients with astigmatism still had astigmatism which ranged from 0.25D - 3.50D; post operative astigmatism usually improves with refraction.

Poor wound apposition, which complicated the surgery in 8 (18.2%) patients in our series (observed first postoperative day), was not severe enough to require a return to theatre for re-suturing. This complication may account for some of the postoperative astigmatism reported in the late postoperative period (>/= 1 week).

The commonest postoperative complication encountered in this study was corneal oedema/ striae observed in 91% of the patients on the first postoperative day. It is probably due to the use of normal saline as irrigating fluid and secondly to handling of the cornea, including mechanical damage to the endothelium during intraocular manipulations. The series by Dawodu et al[19] also had transient corneal edema as the commonest complication. However, Nwosu[22], Bekibele[23] and Mckellar[24] reported uveitis as the commonest postoperative complication in their studies. While Nwosu[22] had postoperative astigmatism (34.1%) as the second commonest complication in his series, Bekibele[23] had raised IOP and corneal oedema/striae (7.3%).

Corneal oedema was easily treated with topical steroids and it resolved within 48 – 72 hours. It took days to weeks to completely resolve.

The Kaduna[21] experience showed a different pattern of complication with pigment deposit on IOL constituting (40%) and iridocyclitis 4%.

The early postoperative complications (<1week) reported in our series are similar to the reports of the Agency for Health care Policy and Research and the American Academy of Ophthalmology. There are often sufficient significant complications at one week to justify a routine postoperative follow-up within this period[24,30-31].

In the late postoperative period we recorded one (2.3%) case of posterior capsule opacification (PCO) while Nwosu[22] recorded 3(7.3%) and Adejor[21] 4%. These differences could be explained by variation in the duration of follow-up.

The raised IOP recorded in the 2 eyes of our patients in the late postoperative period was controlled with Timolol 0.5%eye drops and acetazolamide tablets.

The only case of endophthalmitis reported in this series eventually lost vision in spite of intensive intravenous, oral, subconjunctival and topical antibiotics (Ampiclox, Gentamicin, Ciloxan and Metronidazole). Currently, the mainstay of treatment of postoperative endophthalmitis is intravitreal antibiotics alone or in conjunction with pars plana vitrectomy.[32]

CONCLUSION

The final visual outcome in 77.8% of patients who had refraction post cataract surgery with intraocular lens implantation was good (>/=6/18). Severe complications were few and

most postoperative astigmatism that occurred were corrected with refraction.

We can summarize that the surgery is safe and effective and we recommend the procedure to all cataract surgeons.

REFERENCES

1. The world health report: Life in 21st century. A vision for all. World Health Organization, Geneva 1998: page 47.
2. WHO: 2000 global estimates of blindness.
3. Ezepue, U.F.: The problem of cataract backlog in Anambra and Enugu State of Nigeria: A solution in Community outreach services. Nig. J. Ophthalmol 1993; 2 (2): 21-28
4. Nwosu, S.N.N. Blindness and visual impairment in Anambra and Enugu States of Nigeria. Trop. Geogr. Med. 1994; 46 (6): 346-349
5. Ayanru JO. Blindness in Mid-western State of Nigeria. Trop. Geogr Med 1974: 26; 325-332.
6. Olurin O. Causes of blindness in Nigeria: A study of 1000 cases. W. Afr. Med. J. 1973; 22:97 – 107
7. Faal H, Minassian D, Sowa, S et al. National Survey of Blindness and Low vision in the Gambia: Results. Br. J. Ophthalmol 1989: 73; 82-87
8. Courtright P, Kanjaloti S and Lewallen S. Barriers to acceptance of cataract surgery among patients presenting to district hospital in rural Malawi. Trop. Geogr. Med 1995; 47:15-18
9. Lane SD, Mikhail BI, Reiziana A et al. Sociocultural aspects of blindness in an Egyptian Delta hamlet: visual impairment vs visual disability. Med. Anthropol 1993; 15: 245-60
10. Steinberg EP, Javitt JC and Sharkey PA et al: The content and cost of cataract surgery. Arch. Ophthalmol 1993; III (8): 1041-9.
11. Foster A and Johnson GJ. Treatable blindness. Tropical Doctor 1988; 18:112-11
12. Harding JJ. Can cataract be prevented? Eye 1999; 13: 454-456
13. Ebiloma FA. Couching: Its place in blindness prevention in Nigeria Nig. J. Ophthalmol. 1997: 25-29
14. Ridley H. Acrylic intraocular lenses. Trans. Ophthalmol. Soc. UK 1951; 71: 617-621.
15. Apple DF, Giesser SC and Isenberg RA. Evolution of intraocular lenses. American Academy of ophthalmology Salt Lake City, Utah, 1985:1-3
16. Anastosios JK, Dodick JM, Brauweiler P et al. Dodick photolysis for cataract surgery: Early experience with Q-Switched Neodymium:YAG Laser in 100 consecutive patients. Ophthalmology 1999; 106: 2197- 2202.
17. WHO/PBL. Informal consultation on analysis of blindness prevention outcomes. World Health organization Geneva: 1998: 68
18. Agbeja AM. Intraocular lens implantation: The Nigerian experience. Afr. J. Med and Med Science 1994; 23: 233-237
19. Dawodu OA, Osahon AI, Ideh VCU. Extracapsular cataract Extraction with intraocular Lens implant: An initial experience in Benin City, Nigeria. Nig. J. Surg. Science 2000; 10(1): 13-17
20. Bekibele CO. Anterior chamber intraocular lens surgery at Ago-Iwoye Ogun State Nigeria. Nig. PostGrad. Med. Journal 2002; 9(3): 134-6
21. Adejor GO. Early experience with posterior chamber IOL implantation in National Eye Centre, kaduna Nig. J. Ophthalmol 2002; 1(1): 6-12
22. Nwosu SNN and Onyekwe LO. Intraocular lens implantation surgery in

Onitsha, Nigeria Nig. J. Ophthalmol. 2002; 1(1): 5-9

23. Bekibele CO: Evaluation of outcome of ECCE Surgery with PCIOL at Ago-Iwoye. Nig. J. opthalmol 2001: 9; 52-56
24. Mckellar MJ, Elder MJ. The Early complications of cataract surgery; Is routine review of patients 1 week after cataract extraction necessary? Ophthalmology 2001; 108: 930-935.
25. Peterseim MW and Wilson ME. Bilateral intraocular lens implantation in the paediatric population. Ophthalmology 2000; 107:1261-1266
26. Ruit S, Tabin GC, Nissman SA et al. Low-cost , high-volume extracapsular cataract extraction with posterior chamber intraocular lens implantation in Nepal. Ophthalmology 1999; 106: 1887-1892
27. Natchiar GN, Thulsiraj IO, Negrel AD et al. The Madurai intraocular lens study I & II: A randomised clinical trial comparing complications and visual outcomes of intracapsular cataract extraction and extracapsular cataract extraction with PCIOL. Am. J. Ophthalmol 1998; 125: 1-25
28. Henning A et al: 'One year follow-up results of cataract extraction with ACIOLs and PCIOLs in Nepal. In preparation
29. Henning A, Evans JR, Pradhan D et al. Randomised controlled trial of anterior chamber intraocular lenses. Lancet 1997; 349: 1129-33
30. American academy of Ophthalmology and American society of cataract and refractive surgery. White paper on cataract surgery. Ophthalmology 1996; 103:1152-6
31. Cataract Management Guideline Panel. Management of functional impairment due to cataract in adults. Ophthalomology 1993: 100 (8 supp): IS-350S
32. Das T, Quiroz-Mercado H and Sharma S. Management of post-cataract surgery Endophthalmitis: Emerging issues in Developing countries. Instruction course #702. AAO. New Orleans. Nov.14, 2001.