Original Research Article

Comparison of efficacy of brinzolamide versus combination of brinzolamide and brimonidine in primary open angle glaucoma

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Received: 22-10-2021
Accepted: 05-11-2021

How to cite this article:
Arora D, Dokania A, Jain R, Mathur A. Comparison of efficacy of brinzolamide versus combination of brinzolamide and brimonidine in primary open angle glaucoma. Int J Adv Integ Med Sci 2021;6(4):23-27.

Source of Support: Nil,
Conflicts of Interest: None declared.

Background: Glaucoma is an optic neuropathy, recognized as a leading cause of worldwide visual impairment and Blindness. Elevated intraocular pressure (IOP) is accepted as the single most critical risk factor for primary open angle glaucoma (POAG). Brimonidine is the most modern alpha 2 adrenoreceptor agonist available. It lowers the IOP by both reduction of aqueous humor production and increase outflow of aqueous humor, through uveoscleral pathway. Brinzolamide is an effective inhibitor of carbonic anhydrase 2. It is able to suppress the aqueous humor formation and therefore decreases IOP. Recently, Fixed drug combinations have been introduced-brinzolamide brimonidine fixed combination (BBFC). **Objective:** The study aims to study the comparison of efficacy of brinzolamide versus combination of brinzolamide and brimonidine (BBFC) in primary open angle glaucoma. **Methodology**: The present study was conducted on 80 diagnosed cases of POAG and was divided into 2 groups based on simple random sampling. Group A are treated with a combination of brinzolamide 1% eye drop and brimonidine 0.2% and Group B are treated with brinzolamide 1% eye drops. IOP was done every 6 months, C: D ratio and visual field defects was documented every 2 months till 6 months. **Results:** There was a considerable reduction in IOP by 23–33.7% in Group A while in Group B 18.6–24.3% reduction of IOP from baseline when monitored for 180 days.

KEY WORDS: Primary open angle glaucoma, intraocular pressure, monotherapy, brinzolamide brimonidine fixed combination

INTRODUCTION

Glaucoma is a multifactorial optic neuropathy characterized by progressive loss of retinal ganglion cells and their axons. If untreated a progressive loss of visual field and contrast sensitivity and eventually blindness can occur.[1] Glaucoma is estimated to affect 12 million Indians and causes 12.8% of the blindness in the country.[2] Elevated intraocular pressure (IOP) is accepted as the single most critical risk factor for chronic open angle glaucoma; it contributes to optic nerve directly due to pressure effect and indirectly decreases the blood supply to optic nerve head (Ischemia of optic nerve head) and subsequent visual field loss. Untreated glaucoma results in permanent damage to optic disc and visual field loss resulting in blindness. The three most important means of diagnosis are – IOP, fundus examination, visual field testing.[3]

- Primary open angle glaucoma (POAG) is characterized by increased IOP along with optic neuropathy. It results from defective aqueous humor drainage through trabecular meshwork and uveoscleral pathways. Reduction of IOP is the mainstay therapy for the glaucoma. The preferred treatment is topical monotherapy.[4] In general, more than one medication is required to achieve adequate control of IOP
- There are benefits of fixed drug combinations which are very well achieved like target IOP control. There are economic

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benefits, better tolerability and adherence, preventing the washout effect due to simultaneous instillation of multiple medications concurrently. Furthermore, this fixed drug combinations primarily promote the compliance of patients and perseverance with treatment[5]

- Brimonidine is the most modern alpha 2 adrenoreceptor agonist available. It lowers the IOP by both reducing aqueous humor production and increases aqueous outflow through the uveoscleral pathway.[6] Brinzolamide is an effective inhibitor of carbonic anhydrase 2. It is able to suppress the aqueous humor formation and therefore decreases IOP[7]
- The present study is undertaken to study the clinical efficacy of topical brinzolamide in comparison to combination of brinzolamide and brimonidine in patients with POAG.

MATERIALS AND METHODOLOGY

Randomized control study done in Rohilkhand Medical College and Hospital, Bareilly. Study was done in period between November 2019 and October 2020. Subjects were randomly selected POAG patients consenting to participate. The Sample size taken was of 80 cases and divided into 2 groups. Group A- This group will include 40 patients using a brinzolamide brimonidine fixed combination (BBFC) eye drops. Group B- This group will include 40 patients using Brinzolamide eye drops.

Inclusion Criteria

1. Newly diagnosed cases of POAG
2. Age above 40 years

Exclusion Criteria

1. Acute angle closure glaucoma/narrow angle glaucoma
2. Secondary Glaucoma
3. Hypersensitivity to drugs
4. Second/third degree heart block
5. Ocular pathology
6. Cup disc ratio > 0.8.

Methodology

All the patients were enrolled after their written and informed consent. First, all the patients were asked for basic information on pre designed semi-structured questionnaire and then they underwent required investigations.

A detailed ocular examination is done including all the features that help in diagnosing the condition and also the features that may affect the visual final outcome.

- The IOP is measured once every fortnight for 6 months using Goldmann applanation tonometer, 2 readings are taken to establish the final IOP
- The VF defects are documented by Appasamy Auto Perimeter (Static) model no. AP 901H, at the commencement of the study and then monitored every 2 months
- Best corrected visual acuity by snellen's chart, at the commencement of the study
- Optical coherence tomography (OCT) to evaluate C: D ratio, at the commencement of the study, then monitored every 2 months.

Materials

- Brinzolamide eye drops 1%
- Brimonidine eye drops 0.2%
- Applanation Tonometer
- Visual field analysis by perimetry
- Snellen's chart for visual acuity
- Cup: Disc Ratio by OCT.

OBSERVATION AND RESULTS

A randomized control study was conducted in patients of POAG for comparison of the drugs at Rohilkhand Medical College and Hospital, Bareilly. Details of the patient were obtained such as Socio-demographic profile, IOP, visual acuity, C: D ratio, Visual field defects (VFD) were collected. All the data entered into Microsoft excel spreadsheet and analyzed with the help of SPSS software version 20.0

- In our study, out of 40 patients in Group A- 5(12.5%) were found in age group of 40–45 years, 8 (20%) were found in age group of 46–51 years, 8 (20%) were found in age group of 52–57 years, 12 (30%) were found in age group of 58–63 years and 4 (10%) were found in age group of 64–69 years 1 (2.5%) in age group of 70–75 years, 2(5.0%) in 76–81 years
- Out of 40 patients in Group B – 5 (12.5%)was there in age group of 40–45 years, 5 (12.5%) were found in 46–51 years, 5 (12.5%) in of 52–57 years, 15 (37.5%) in 58–63 years, 4 (10%) in 64–69 years, 2 (5%) in 70–75 years, 2 (5%)in 76–81 years and 2 (5%) in 82–90 years
- Mean age of patients in Group A was 52.92 years and in Group B was 59 years
- In our study, out of 40 patients in Group A 20 (50%) were male and 20 (50%) were female and in Group B about of 40 patients 22 (55%) were male and 18 (45%) were female. There was no significant difference in sex of patients in between Group A and Group B.
- Above table and below figures show that mean IOP distribution of Group A and group B from the baseline to 180 days in right eye where the decrease in mean IOP was observed on all investigation days and at all individual time points for both the groups. Mean IOP in Group A at baseline was 28.48 and at 180 days was 21.51 and in Group B. IOP at baseline was 28.13 and at 180 days in was 22.35. Mean difference in IOP from baseline to 180 days in group A was 6.97 and in Group B mean difference in IOP from baseline to 180 days was 5.78. However, in this context Group A showed a greater efficiency when contrasted to Group B
- After applying independent student *t*-test statistically significant values been observed in IOP at 120 days and 180 days since the calculated *P*-value found to be <0.05 level.

Above table and below figures show mean IOP distribution of Group A and Group B from the baseline to 180 days in right eye

where the decrease in mean IOP was observed on all investigation days and at all individual time points for both the groups. Mean IOP in Group A at baseline was 26.33 and at 180 days was 19.89 and in Group B mean, IOP at baseline was 25.93 and at 180 days it was 20.86. Mean difference in IOP from baseline to 180 days in Group A was 6.44 and in Group B mean difference in IOP from baseline to 180 days was 5.07. However, in this context Group A showed a greater efficiency when contrasted to Group B.

After applying *t*-test statistically significant values been observed in IOP at 120 days, 135 days, 150 days and 165 days since the calculated *P*-value found to be <0.05 level.

DISCUSSION

Glaucoma is a major cause of ocular morbidity worldwide and a major health burden in the developed world. Through simple random sampling, there were divided into two groups. Group A were treated with a combination of brinzolamide 1% and brimonidine 0.2% and Group B were treated with monotherapy that is brinzolamide 1.%. The results were analyzed and compared with similar previous studies.

- The mean IOP distribution of group A and group B from the baseline to 180 days where the decrease in mean IOP was observed on all investigation days, every 15 days for every 6 months and at all individual time points for both the groups. However, in this context group A showed a greater efficiency when contrasted to Group B. Group A Mean percentage reductions in IOP from baseline were 23–33.7% for BBFC and for monotherapy by binzolamide 0.2% were 18.6–24.3%.

Mean difference in IOP reduction (right eye) [Figure 1] from baseline to 180 days in Group A was 6.97 mmg whereas in Group B the mean difference was 5.78mmhg [Table 1].

Mean difference in IOP reduction (left eye) [Figure 2] from baseline to 180 days in Group A was 6.44mmhg and in Group B it was 5.07 mmhg [Table 2].

- Since IOP is the only modifiable factor in treatment of Glaucoma, there were no decrease in severity observed in the other parameters that is C: D ratio and VFD
- Overall, the clinical efficiency been found to be of satisfactory level but for Group A much greater efficiency

Table 1: Comparison of mean IOP test of patients at different time interval (baseline to 180 days) in between group a and group b in right eye

IOP	Group	*n*	Mean	Std. Deviation	Std. Error Mean	*P*-value
IOP B RE	Group A	40	28.48	3.64	0.58	0.670#
	Group B	40	28.13	3.67	0.58	
IOP 15 RE	Group A	40	26.68	3.59	0.57	0.614#
	Group B	40	26.28	3.47	0.55	
IOP 30 RE	Group A	40	26.13	4.07	0.64	0.860#
	Group B	40	26.28	3.47	0.55	
IOP 45 RE	Group A	40	26.10	4.06	0.64	0.836#
	Group B	40	26.28	3.47	0.55	
IOP 60 RE	Group A	40	25.93	3.87	0.61	0.672#
	Group B	40	26.28	3.47	0.55	
IOP 75 RE	Group A	40	25.25	3.64	0.58	0.509#
	Group B	40	25.75	3.08	0.49	
IOP 90 RE	Group A	40	23.96	3.10	0.50	0.488#
	Group B	40	24.41	2.62	0.41	
IOP 105 RE	Group A	40	22.56	3.23	0.51	0.641#
	Group B	40	22.87	2.59	0.41	
IOP 120 RE	Group A	40	20.72	2.84	0.45	0.010*
	Group B	40	22.35	2.66	0.42	
IOP 135 RE	Group A	40	21.51	2.15	0.34	0.150#
	Group B	40	22.31	2.73	0.43	
IOP 150 RE	Group A	40	21.51	2.15	0.34	0.150#
	Group B	40	22.31	2.73	0.43	
IOP 165 RE	Group A	40	21.51	2.15	0.34	0.150#
	Group B	40	22.31	2.73	0.43	
IOP 180 RE	Group A	40	21.51	2.15	0.34	0.013*
	Group B	40	22.31	2.73	0.43	

#Statistically not significant, *statistically significant

Table 2: Comparison of mean IOP test of patients at different time interval (baseline to 180 days) in between Group A and Group B in left eye

IOP	Group	*n*	Mean	Std. Deviation	Std. Error Mean	*P*-value
IOP B LE	Group A	40	26.33	2.77	0.438	0.520#
	Group B	40	25.93	2.77	0.438	
IOP 15 LE	Group A	40	24.40	2.73	0.432	0.442#
	Group B	40	23.93	2.77	0.438	
IOP 30 LE	Group A	40	24.35	2.65	0.418	0.427#
	Group B	40	23.88	2.67	0.422	
IOP 45 LE	Group A	40	24.30	2.55	0.404	0.469#
	Group B	40	23.88	2.67	0.422	
IOP 60 LE	Group A	40	24.30	2.55	0.404	0.496#
	Group B	40	23.88	2.67	0.422	
IOP 75 LE	Group A	40	24.30	2.55	0.404	0.496#
	Group B	40	23.88	2.67	0.422	
IOP 90 LE	Group A	40	24.10	2.26	0.358	0.686#
	Group B	40	23.88	2.67	0.422	
IOP 105 LE	Group A	40	23.50	1.94	0.306	0.528#
	Group B	40	23.83	2.60	0.411	
IOP 120 LE	Group A	40	21.89	1.69	0.267	0.021*
	Group B	40	22.81	1.80	0.285	
IOP 135 LE	Group A	40	19.89	1.69	0.267	0.013*
	Group B	40	20.86	1.75	0.277	
IOP 150 LE	Group A	40	19.89	1.69	0.267	0.013*
	Group B	40	20.86	1.75	0.277	
IOP 165 LE	Group A	40	19.89	1.69	0.267	0.013*
	Group B	40	20.86	1.75	0.277	
IOP 180 LE	Group A	40	19.89	1.69	0.267	0.150#
	Group B	40	20.86	1.75	0.277	

#Statistically not significant, *statistically significant

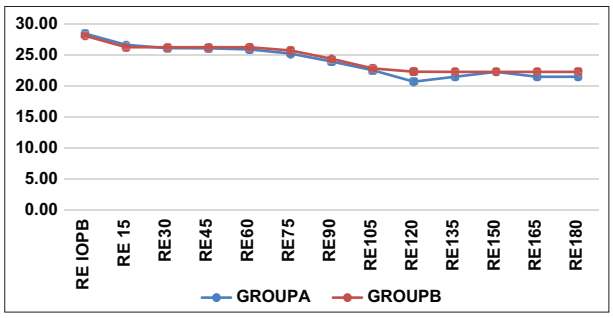

Figure 1: Comparison of right eye IOP at different time intervals

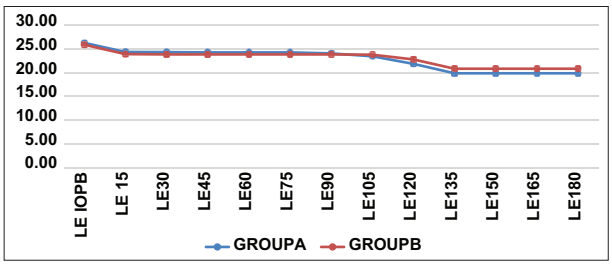

Figure 2: Comparison of mean IOP in left eye at different time intervals

was achieved. The amount of IOP reduction achieved in our study by this fixed combination was lower compared to that reported in other studies

- In this context according to established dosage guidelines for the comparative medicines, previous trials in the United States have proven the effectiveness and safety of BBFC compared to brinzolamide and brimonidine as been studied by Katz *et al.*, Nguyen *et al.*, Whitson *et al.*,[8] Realini *et al.*
- In a study by Aung[9] at 3 months, BBFC lowered mean diurnal IOP from baseline to a greater extent than either of monotherapy drugs which were Brinzolamide ($P < 0.0001$; *t*-test) and Brimonidine ($P < 0.0001$). The mean percentage reduction in IOP from baseline was 26.7% to 36% in BBFC and for Brinzolamide it was 22.4–27.9%.
- In a study by Realini *et al.*,[10] the magnitude of peak reduction from baseline with BBFC was observed was 33.4–34.5% which were similar to other combination drugs

of fixed therapy for example Dorzolamide 2%/Timolol 0.5% (26.1–32.3%) and Brimonidine 0.2%/Timolol0.5%. At 3 months, mean IOP of BBFC group was significantly lower than that of the monotherapy group (<0.0001).

- Studies by Nordlund *et al.*,[6] Stewart and Garrison[7] in this line have cautioned that BBFC is the only constant combination. Other fixed-combination treatments are commercially available, and they all comprise a beta blocker in conjunction with another IOP-lowering medication
- However, studies have been done looking at the 24-h IOP profiles of the individual components- Brinzolamide (or its equivalent dorzolamide) and Brimonidine. Orzalesi *et al.*[11] showed that dorzolamide is effective in reducing night time IOP. These indicate that the nocturnal IOP reduction of this fixed combination is attributable mainly to brinzolamide
- In previous Phase III trials by Katz *et al.*[12] and Nguyen *et al.*[5] have shown that the initial lowering in IOP achieved at 2 weeks by this BBFC is sustained for up to 6 months. They concluded that the therapeutic effect of this combination occurs after initial few weeks of administration (within first 2 weeks) and continues for up to 6 months. Hence, the results of our study too is most likely to reflect long term efficacy of brinzolamide and brimonidine in our population
- In our study, we found similar results; there was an average reduction of IOP around 23 to 33.7 % (5.8–8.7 mmhg) for BBFC and 18.6–24.3% (4.6–6.3mmhg) for monotherapy by Brinzolamide 0.2%
- It was seen in the right eye that, significant reduction in IOP ($P < 0.05$) at 120 and 180 days. Whereas for left eye, significant values have been observed in IOP at 120, 135, 150, and 165 days ($P < 0.05$).

CONCLUSION

Glaucoma is a worldwide disease that affects millions of individuals and is responsible for visual impairment in majority of cases. Patients vision loss can be prevented or delayed by reducing IOP. In our study, both the groups having brinzolamide and brimonidine combination (BBFC) and brinzolamide monotherapy has shown to efficiently decrease IOP. The safety and IOP lowering efficacy by BBFC may be advantageous to patients that are unresponsive to monotherapy or in patients where drugs like Beta blockers are contraindicated, as it is the only fixed combination glaucoma therapy currently available that do not constitute a beta blocker. Thus, based on the result of our study, it can be concluded that Brinzolamide 1%/Brimonidine 0.2% fixed combination is more effective and safer for decreasing IOP in comparison to monotherapy by brinzolamide 1% in treatment for POAG.

REFERENCES

1. Chan K, Testa M, McCluskey P. Ocular comfort of combination glaucoma therapies. J Ocular Pharmacol Ther 2007;23:372-6.
2. Ravi T, Paul P, Muliyil J. Glaucoma in India. J Glaucoma 2003;12:81-7.
3. Saxena R, Prakash J, Mathur P, Gupta SK. Pharmacotherapy of glaucoma. Indian J Pharmacol 2002;34:71-85.
4. Higginbotham EJ. Considerations in glaucoma therapy: Fixed combinations versus their component medications. Clin Ophthalmol 2010;4:1-9.
5. Nguyen QH, McMenemy MG, Realini T, Whitson JT, Goode SM. Phase 3 randomized 3-month trial with an ongoing 3-month safety extension of fixed-combination brinzolamide 1%/brimonidine 0.2%. J Ocul Pharmacol Ther 2013;29:290-7.
6. Nordlund JR, Pasquale LR, Robin AL, Rudikoff MT, Ordman J, Chen KS, *et al.* The cardiovascular, pulmonary, and ocular hypotensive effects of 0.2% brimonidine. Arch Ophthalmol 1995;113:77-83.
7. Stewart WC, Garrison PM. Beta-blocker-induced complications and the patient with glaucoma. Newer treatments to help reduce systemic adverse events. Arch Intern Med 1998;158:221-6.
8. Whitson JT, Realini T, Nguyen QH. Six-month results from a Phase III randomized trial of fixed-combination brinzolamide 1% +brimonidine 0.2% versus brinzolamide or brimonidine monotherapy in glaucoma or ocular hypertension. Clin Ophthalmol 2013;7:1053-60.
9. Aung T. Twice daily brinzolamide/brimonidine fixed combination versus brinzolamide or brimonidine in open angle glaucoma. Am Acad Ophthalmol 2014;121:2348-55.
10. Realini T, Nguyen QH, Katz G. Fixed-combination brinzolamide 1%/brimonidine 0.2% vs monotherapy with brinzolamide or brimonidine in patients with open-angle glaucoma or ocular hypertension: Results of a pooled analysis of two phase 3 studies. Eye 2013;27:841-7.
11. Orzalesi N, Rossetti L, Bottoli A, Fumagalli E, Fogagnolo P. The effect of latanoprost, brimonidine, and a fixed combination of timolol and dorzolamide on circadian intraocular pressure in patients with glaucoma or ocular hypertension. Arch Ophthalmol 2003;121:453-7.
12. Katz G, Dubiner H, Samples J, Vold S, Sall K. Three-month randomized trial of fixed-combination brinzolamide, 1%, and brimonidine, 0.2%. JAMA Ophthalmol 2013;131:724-30.

ORIGINAL ARTICLE

Post-tubercular still a major cause of bronchiectasis in India

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Received: 05-11-2021
Accepted: 23-11-2021

How to cite this article:
Agarwal R, Agrawal R, Kumar D. Post-tubercular still a major cause of bronchiectasis in India. Int J Adv Integ Med Sci 2021;6(4):28-31.

Source of Support: Nil,
Conflicts of Interest: None declared.

Introduction: Bronchiectasis is now being recognized more due to frequent use of high-resolution computerized tomography (HRCT). Etiology varies between different populations. Immune deficiency syndromes, metabolic, and ultrastructural defects are the predominant etiologic factors in developed countries, while bacterial and viral infections continue to be major causes of the disease in the developing countries. **Objective:** The objective of the study was to study the profile of bronchiectasis patients and establish its cause. **Materials and Methods:** A prospective study was conducted in Rohilkhand Medical College and Hospital, Bareilly, during October 2019 to March 2020 in patients with confirmed bronchiectasis on HRCT chest. **Results:** Out of 32 patients, 59.37% of patients were female. The most common symptom was cough with sputum 78.12%. Clubbing was present in 25%. On spirometry, obstructive pattern is seen in 62.5% cases, restrictive pattern is seen in 12.5% cases, mixed pattern in 18.75% cases and normal in 6.25% cases. *Pseudomonas aeruginosa* was the most common isolated pathogen 21.8%. On HRCT, cystic bronchiectasis was seen in 46.87%. The most common cause of bronchiectasis found was post-tubercular in 65.6% followed by COPD 21.8% and ABPA 12.5% of patients. History of TB was present in 65.6% of cases. **Conclusion:** Post-tubercular was the leading cause of bronchiectasis. Pseudomonas was the most common pathogen isolated from the respiratory specimen. On spirometry, obstructive impairment was found in majority of patients. Cystic bronchiectasis was mostly seen in post-tubercular patients while cylindrical type was seen in COPD and ABPA.

KEY WORDS: Bronchiectasis, post-tubercular, high-resolution computerized tomography thorax, cystic bronchiectasis, *pseudomonas aeruginosa*, cough with expectoration, obstructive spirometry

INTRODUCTION

Bronchiectasis is a growing global health problem.[1] Bronchiectasis (*broncos,* airways; *ectasia*, dilatation) is defined as "abnormal irreversible dilatation of one or more cartilage-containing airways – bronchi, caused by inflammatory destruction of the muscular and elastic component of bronchial walls."

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In today's scenario, bronchiectasis has been recognized more frequently because of more often use of high-resolution computerized tomography (HRCT).

Immune deficiency syndromes, metabolic, and ultrastructural defects are the predominant etiologic factors in developed countries, while tuberculosis, post-infection, idiopathic, and allergic bronchopulmonary aspergillosis are highly prevalent in the developing countries with less common causes as chronic obstructive pulmonary disease, asthma, rheumatoid arthritis and primary ciliary dyskinesia, non-tuberculous mycobacteria, gastroesophageal reflux disease, immunological deficiency, and alpha-1 anti-trypsin deficiency. CT scan in patient following treatment for tuberculosis has identified moderate and severe bronchiectasis in approximately 40% of patients.[1]

The classical clinical symptoms of bronchiectasis are daily cough and production of mucopurulent sputum. Purulent, tenacious sputum produced, frequently worsens in the morning (accumulated during recumbency during sleep) is present in most of the patients.

The diagnosis usually depends on presentation with a persistent chronic cough and sputum production accompanied by consistent radiographic features. Although chest radiographs lack sensitivity, the presence of "tram tracks" that indicate dilated airways is consistent with bronchiectasis. The chest X-ray may also show the increased pulmonary markings, atelectasis, ring-like structures, and mucus plugging (finger-in-glove).

Chest CT is more specific and is the imaging modality of choice for confirming the diagnosis of bronchiectasis. HRCT can accurately diagnose bronchiectasis, localize, and describe areas of parenchymal abnormality, and identify bronchiolar abnormalities and mucus plugging. It also can identify focal areas of air trapping as an indicator of small airway disease (mosaic attenuation).

Specific CT Findings Include

1. Airway dilation ("tram tracks" or "signet-ring sign" – a cross-sectional area of the airway at least 1.5 times that of the adjacent vessel)
2. Lack of bronchial tapering (including the presence of tubular structures within 1 cm from the pleural surface)
3. Bronchial wall thickening in dilated airways, inspissated secretions (e.g., the "tree-in-bud" pattern), or cysts emanating from the bronchial wall (especially pronounced in cystic bronchiectasis).

Non-specific Findings Include

1. Peribronchial cuffing (thickened hazy bronchial wall)
2. Finger in gloves (mucus filled bronchi)
3. Multiple air fluid levels (fluid-filled bronchi).

Cartier *et al*.[2] found that bilateral majorly upper lobe bronchiectasis is seen most commonly in CF, ABPA, and sequelae of tuberculosis. The middle-lobe involvement with irregular ground-glass nodules is characteristic of NTM. The lower lobe involvement is seen in most other causes.

Bronchiectasis has still been considered as an "orphan" disease because of low clinical suspicion, commercial interest, and research activity. Therefore, scientific concern in non-cystic fibrosis bronchiectasis diminished, with limited literature about this issue compared to other "obstructive lung diseases" and "pneumonia."[3]

Objective

The objective of the study was to study the profile of bronchiectasis patients and establish its cause.

MATERIALS AND METHODS

A prospective study was conducted in Rohilkhand Medical College and Hospital, Bareilly, during October 2019–March 2020 in patients with 32 confirmed bronchiectasis on HRCT chest.

RESULTS

Out of 32 patients, 59.37% (n = 19) of patients were female [Figure 1].

The most common symptom was cough with sputum 84.3% (n = 27), dyspnea 75% (n = 24), hemoptysis 28.1% (n = 9), and dry cough 15.6% (n = 5) [Figure 2].

The most common cause of bronchiectasis found was post-tubercular in 65.6% (n = 21) followed by COPD 21.8% (n = 7) and ABPA 12.5% (n = 4) patients. History of TB was present in 65.6% (n = 21) of cases [Figure 3].

Among post-tubercular patients (n = 21), the most common symptom is cough with expectoration found in 95.2% (n = 20) of patients, followed by dyspnea in 76.1% (n = 16) of patients, hemoptysis in 33.3% (n = 7) of patients, and dry cough in 3.1% (n = 1) of patients. Among non-tubercular patients, the most common symptom was dyspnea found in 72.7% (n = 8)

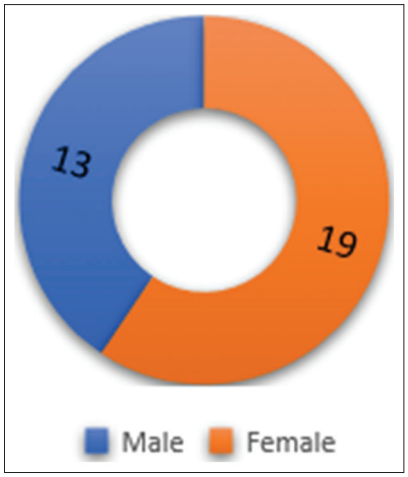

Figure 1: Gender distribution

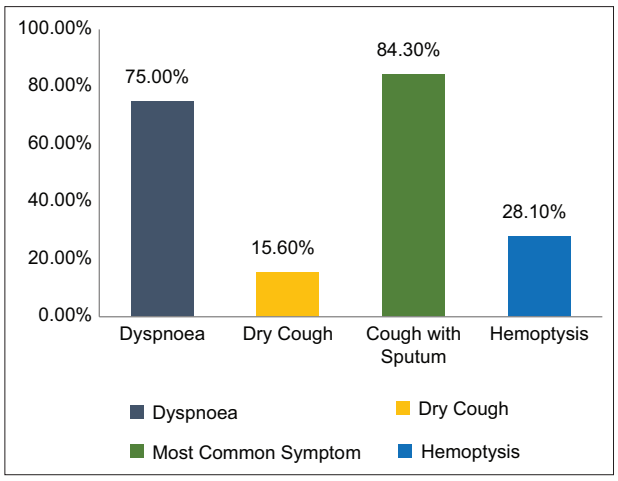

Figure 2: Most common symptom

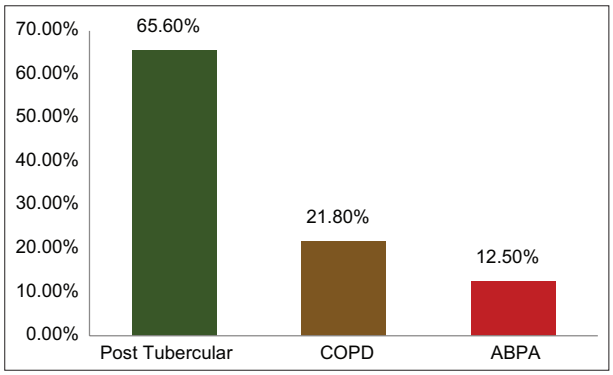

Figure 3: Most common etiology

of patients, followed by cough with expectoration in 63.6% (n = 7) of patients, dry cough in 36.3% of patients (n = 4), and hemoptysis in 18.1% (n = 2) of patients.

Clubbing was present in 25% (n = 8).

On spirometry, obstructive pattern 62.5% (n = 20), restrictive 12.5% (n = 4), mixed 18.75% (n = 5), and normal in 6.25% (n = 2) [Figure 4].

On HRCT, cystic bronchiectasis was seen in 46.87% (n = 15) followed by cylindrical 34.37% (n = 11) and varicose 18.75% (n = 6) [Figure 5].

Bilateral involvement was seen in 59.37% (n = 19) and upper lobe involvement was found in 75% (n = 24), middle lobe 43.75% (n = 14), and lingula 34.37% (n = 11). More than 1 lobe was involved in 71.8% (n = 23). Unilateral upper lobe involvement was seen in 53.12% (n = 17).

Pseudomonas aeruginosa was the most common isolated pathogen 21.8% (n = 7).

DISCUSSION

In my study, post-tubercular was the most common etiology found which was in correlation with Indian registry of bronchiectasis,[4] that is, 65.6% versus 35.5%, respectively, may be because my study was single-center study conducted in Uttar Pradesh for 6 months with higher tuberculosis burden in contrast to Indian bronchiectasis registry which was multicentric study conducted for 2 years across India.

The other causes are ABPA 12.50% which is in correlation with Indian Bronchiectasis Registry[4] which showed 8.4% cases of ABPA but EMBRARC[5] showed 2.6% of patients.

In my study, cystic bronchiectasis was most common in 46.87% [Figure 6] which is in correlation with Indian bronchiectasis registry[4] where cystic bronchiectasis was the most common type. The reason behind cystic bronchiectasis being the most common type is majority of the cases were post-tubercular.

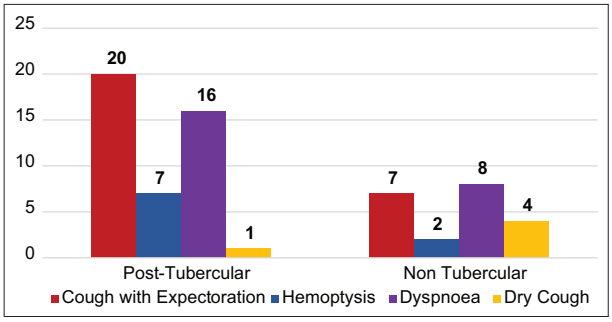

Figure 4: Comparison of symptoms in post-tubercular and non-tubercular patients

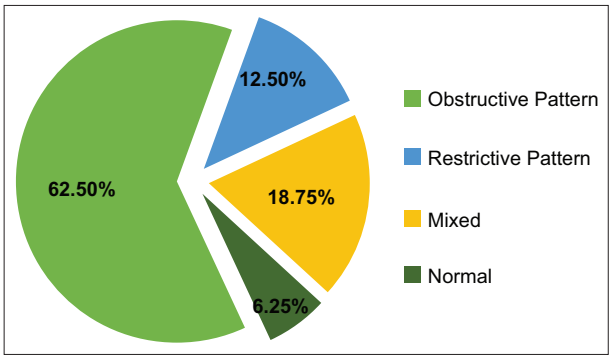

Figure 5: Spirometry pattern

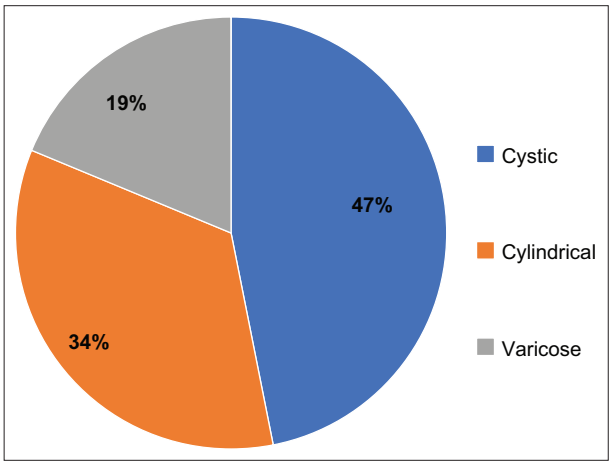

Figure 6: HRCT findings

Upper lobe involvement is most common in my study 75% as majority of the cases are post-tubercular as shown in Utpat *et al*.[6]

Limitations of the Study

It is difficult to generalize the result as sample size is low and also because, it is a single-centered study.

Due to COVID-19 pandemic, less cases were reported.

CONCLUSION

Post-tubercular was the leading cause of bronchiectasis. Pseudomonas was the most common pathogen isolated from the

respiratory specimen. Female predominance was seen. Cough with expectoration was the most common symptom. Among post-tubercular cases, cough with expectoration was found to be the most common symptom and among non-tubercular cases. Cough with expectoration was found to be the most common symptom and among non-tubercular cases, dyspnea was the most common symptom. In majority of the patients, on spirometry, obstructive pattern was present. Cystic bronchiectasis was mostly seen in post-tubercular patients while cylindrical type was seen in COPD and ABPA.

REFERENCES

1. Habesoglu MA, Ugurlu AO, Eyuboglu FO. Clinical, radiologic, and functional evaluation of 304 patients with bronchiectasis. Ann Thorac Med 2011;6:131.
2. Cartier Y, Kavanagh PV, Johkoh T, Mason AC, Müller NL. Bronchiectasis: Accuracy of high-resolution CT in the differentiation of specific diseases. AJR Am J Roentgenol 1999;173:47-52.
3. Dhar R, Singh S, Talwar D, Mohan M, Tripathi SK, Swarnakar R, *et al*. Bronchiectasis in India: Results from the European multicentre bronchiectasis audit and research collaboration (EMBARC) and respiratory research network of India registry. Lancet Global Health 2019;7:e1269-79.
4. Chalmers JD, Chang AB, Chotirmall SH, Dhar R, McShane PJ. Bronchiectasis. Nat Rev Dis Prim 2018;4:1-8.
5. Choi H, Yang B, Nam H, Kyoung DS, Sim YS, Park HY, *et al*. Population-based prevalence of bronchiectasis and associated comorbidities in South Korea. Eur Respir J 2019;54:1900194.
6. Utpat K, Nanaware S, Desai U, Joshi JM. Clinical profile and aetiology of bronchiectasis. J Krishna Inst Med Sci Univ 2017;6:28-37.

ORIGINAL ARTICLE

Monopolar vs bipolar transurethral resection in benign hyperplasia of prostate

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Received: 24-09-2021
Accepted: 07-10-2021

How to cite this article:
Agarwal R, Maheshwari H, Seth S. Comparison between monopolar and bipolar transurethral resection of the prostate for benign prostatic hyperplasia - A randomized Controlled study. Int J Adv Integ Med Sci 2021;6(4):32-36.

Source of Support: Nil,
Conflicts of Interest: None declared.

Background: Benign prostate hyperplasia (BPH) is characterized by an unregulated proliferation of smooth muscle, glandular epithelium, and connective tissue within the prostate. Males with BPH are found to be at risk for developing lower urinary tract symptoms. These symptoms include urgency, nocturia (awakening at night for voiding), hesitancy, and incomplete emptying of bladder (voiding and require voiding again almost immediately. These symptoms among patients negatively affect quality of life and over time, can have serious consequences including acute retentions of urine and urinary tract infections. The present study was thus framed to compare monopolar and bipolar transurethral resection of the prostate (M-TURP and B-TURP) gland for benign prostatic hyperplasia and to know which procedure was superior to the other.
Results: About one-third of patients of M-TURP (36.6%) and 33.9% of B-TURP group were between 61 and 70 years of age. The mean age of patients of M-TURP and B-TURP was 62.08 ± 10.80 and 61.27 ± 10.46 years, respectively. Retention of urine was present in 18 (30.5%) patients in the M-TURP group and 10 (16.9%) patients in B-TURP group. Hematuria was present in 15 patients (25.4%) in M-TURP group and 13 patients (22%) in B-TURP group. The post-operative median value of International Prostate Symptom Score (IPSS) score in M-TURP and B-TURP was 13 and 12, respectively, which was significantly improved in both the groups as pre-operative median value was 24 and 23, respectively. The post-operative median value of quality of life (QOL) index was 1 in both the groups, which was significantly improved. Hence, IPSS score and QOL index were equally improved in both the groups. There was significant (P = 0.0001) difference for IPSS score and QOL index in both the groups, and there was no significant (P > 0.05) difference between the two groups

KEY WORDS: Benign prostate hyperplasia, Bipolar-transurethral resection of the prostate, Monopolar-transurethral resection of the prostate

INTRODUCTION

Benign prostate hyperplasia (BPH) is characterized by an unregulated proliferation of smooth muscle, glandular epithelium, and connective tissue within the prostate.[1] Males with BPH are found to be at risk for developing lower urinary tract symptoms (LUTS). These symptoms include urgency, nocturia (awakening at night for voiding), hesitancy, and incomplete emptying of bladder (voiding and require voiding again almost immediately.[2]

These symptoms among patients negatively affects quality of life (QOL) and over time, can have serious consequences including acute retentions of urine and urinary tract infections.[3,4]

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BPH prevalence rises significantly with age; around 50% of men demonstrate histopathological evidence of BPH by 60 years, increasing to 90% by 85 years.[5] Considering the present aging population, it is evident that this condition will increasingly become a center piece of urological surgical care while continuing to exert a substantial cost pressure on healthcare services. Therefore, it is important that any interventions used to treat BPH are effective with the minimal risk of complications. Initially, patients with a suspicion of BPH are clinically examined. A digital rectal examination is performed. These patients then undergo simple bedside investigations, urine analysis, and a validated symptom questionnaire, the International Prostate Symptom Score (IPSS).[6]

Most commonly used drugs in BPH are alpha blockers. Prior systematic reviews have shown that alpha blockers can reduce IPSS scores by 20–50% and increase flow rates by 15–45%.[7] However, they have a considerable adverse side effect profile including postural hypotension (sudden drop of blood pressure while standing), dizziness, headache, syncope (fainting), peripheral edema (fluid accumulate in the limbs), and retrograde ejaculation.

As a result, 10% of men are forced to withdraw from medical therapy. Surgical therapy is usually considered once a lack of medical therapy efficacy has been established; increasing symptoms bother and rising post void residual urine are documented. Further, if a patient cannot tolerate medications due to side effects, surgery may be the only viable option for symptom relief.[8,9]

Surgical intervention ranges from transurethral resection of the prostate (TURP) to prostatectomy; the most common surgical technique currently used for BPH is TURP. Even with the rise of new technologies which are minimally invasive, till now TURP is a benchmark of surgical treatment for BPH.[10,11]

Although efficacy of monopolar TURP (M-TURP) in prostate resection is accepted, complications in the perioperative period and associated costs are a concern.[12,13]

The present study was thus framed to compare M-TURP and Bipolar TURP (B-TURP) gland for benign prostatic hyperplasia and to know which procedure was superior to the other.

Aim and Objectives

The aim of the study was to compare the clinical efficacy and safety of M-TURP and B-TURP for treating patients of benign prostatic hyperplasia.

MATERIAL AND METHODOLOGY

Study Design

The study design was randomized controlled study.

Study Settings

The study was conducted in the Department of Surgery, Rohilkhand Medical College and Hospital, Bareilly.

Study Duration

The study was done between November 1, 2019, and October 31, 2020.

Ethical Aspects

Informed consent was obtained from all the participants. Ethical approval for the study was obtained from the Institutional Ethical Committee.

Subjects

All patients diagnosed as benign prostatic hyperplasia who underwent TURP.

Inclusion Criteria

All patients of BPH who underwent TURP were included in the study.

Exclusion Criteria

The following criteria were excluded from the study:

- Prostatic cancer
- Urethral stricture,
- Neurogenic bladder
- Prostatitis
- Active urinary infection
- History of the previous prostate surgery
- Coagulopathy

Randomization Criteria

Patients were randomly divided into two groups, those who underwent M-TURP and those who underwent B-TURP and this randomization was done using the website www.random.org.

Procedure

All patients of BPH admitted in the indoor department of surgery in Rohilkhand Medical College and Hospital, Bareilly between November 1, 2019, and October 31, 2020, and who underwent TURP gland were randomized into two groups, one which underwent M-TURP and the other which underwent B-TURP.

A complete clinical history and physical examination including a focused neurological examination with genital and rectal examination was done for all the patients.

The following diagnostic tests were performed:

- Hemoglobin, total leukocyte count, and differential leukocyte count
- Blood urea, serum creatinine, serum sodium, and potassium levels
- Urine routine and microscopic examination, and urine culture and sensitivity
- Ultrasonography of kidney, ureter, and bladder with prostate volume and post-void residual volume.
- Uroflowmetry

- Serum prostate-specific antigen (PSA) (PSA level <4 ng/ml) was considered normal)
- Coagulation profile
- Fasting, random, and post-prandial blood sugar level.

Abnormal PSA or digital rectal examination findings were triggers for a transrectal USG-guided prostate biopsy.

All patients underwent M-TURP or B-TURP. Spinal anesthesia was used for all patients and patients underwent the procedure in a lithotomy position. Preliminary cystourethroscopy was done to assess the anterior urethra verumontanum, prostate gland, bladder mucosa and ureteric orifices. A 26-F Karl Storz continuous flow resectoscope with Baum Rucker type of active working element was used for resection with glycine as irrigant for M-TURP and saline as an irrigant for B-TURP.

For all patients, resection time, intraoperative complication was noted and 3-way Foley's catheter was inserted at the end of the procedure and irrigation started and continued postoperatively till clear urine was seen. After the procedure, the specimen was kept in a formalin filled jar and sent to the pathology department for histopathological examination.

All patients were monitored in the post-operative period for hematuria.

Hemoglobin (gm/dl), serum sodium (mmol/L), and packed cell volume (%) were done on post-operative day 1. Foley's catheter was removed on the day when clear urine was seen. All patients were followed up and reviewed with post-operative IPSS and QOL index were recorded after uroflowmetry. Changes in pre-operative and post-operative findings were analyzed.

IPSS score consists of seven questions related to symptoms commonly seen in BPH patients,

1. Incomplete emptying
2. Frequency
3. Intermittency
4. Urgency
5. Weak stream
6. Straining
7. Nocturia

Every question has 0–5 points and added together gives a score between 0 and 35. More the score signifies more the severity.
0–7 - Mild symptoms
8–19 - Moderate symptoms
20–35 - Severe symptoms

In QOL index, a single question system was assessed together with the AUA symptom index and considered as a part of the IPSS score. Response ranged from 0 to 6.

All participants were explained about the objectives of the study and an informed and written consent was obtained. Face to face interviews, history and physical examination were conducted. The purpose, benefits, risks, anonymity, and confidentiality of the study were clearly explained to the patients. All the data were entered in a predesigned case record form.

Sample Size

Sample size was 118 as per PS2 (Alpha is.05; power is 0.7; sigma is 6.5; delta is 3; and m is 1).[14]

Statistical Analysis

The results are presented in frequencies, percentages, and mean ± SD. All the data were analyzed using SPSS version 23. Unpaired *t*-test and Chi-square test was used to calculate the *P* value for the categorical and non-categorical data and the significant *P* value was considered when below 0.05. Odds ratio was calculated for the post-operative complications.

RESULTS AND OBSERVATIONS

About one-third of patients of M-TURP (36.6%) and 33.9% of B-TURP group were between 61 and 70 years of age. The mean age of patients of M-TURP and B-TURP was 62.08 ± 10.80 and 61.27 ± 10.46 years, respectively. Retention of urine was present in 18 (30.5%) patients in the M-TURP group and 10 (16.9%) patients in B-TURP group. Hematuria was present in 15 patients (25.4%) in M-TURP group and 13 patients (22%) in B-TURP group. Figure 1 shows the distribution of patients undergoing TURP according to severity of IPSS score and QOL index. IPSS score was between (0 and 7) in no patients in both the groups, between (8 and 19) in three patients in M-TURP and two patients in B-TURP, and between (20 and 35) in 21 patients in M-TURP and 33 patients in B-TURP groups. The median and mean IPSS were 24 and 23.17, respectively, in M-TURP and 23 and 22.53 in B-TURP groups. The median and mean QOL index was 4 and 4.23, respectively, in both M-TURP and B-TURP groups.

Table 1 shows the distribution of patients undergoing TURP according to severity of IPSS score and QOL index. IPSS score was between (0 and 7) in no patients in both the groups, between (8 and 19) in three patients in M-TURP and two patients in B-TURP, and between (20 and 35) in 21 patients in M-TURP and 33 patients in B-TURP groups. The median and mean IPSS was 24 and 23.17, respectively, in M-TURP and 23 and 22.53 in B-TURP groups. The median and mean QOL index was 4 and 4.23, respectively, in both M-TURP and B-TURP groups.

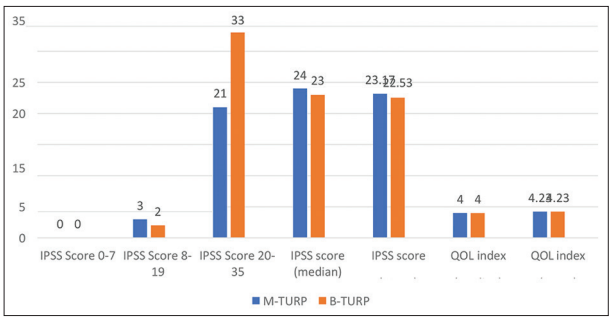

Figure 1: Distribution of patients undergoing TURP according to severity of IPSS score and QOL index

Table 1: Distributions of patients undergoing TURP according to severity of IPSS score and QOL index

IPSS Score	Number of patients (M-TURP)			Number of patients (B-TURP)		
0–7	0			0		
8–19	3			2		
20–35	21			33		
Parameters	**M-TURP**			**B-TURP**		
	Range	**Mean±SD**	**Median**	**Range**	**Mean±SD**	**Median**
IPSS score	19-27	23.17±2.06	24	19–26	22.53±1.76	23
QOL index	3-5	4.23±0.7	4	4-5	4.23±0.7	4

TURP: Transurethral resection of the prostate, IPSS: International prostate symptom score, QOL: Quality of life, M-TURP: Monopolar transurethral resection of the prostate, B-TURP: Bipolar transurethral resection of the prostate

Table 2: Post-operative IPSS score and QOL index

Post-operative	M-TURP		B-TURP		*P*-value
	Median	**Mean±SD**	**Median**	**Mean±SD**	
IPSS Score[1]	13	12.59±1.54	12	12.54±1.54	0.0001*
QOL index[2]	1	1.49±0.57	1	1.49±0.57	0.0001*

P-value[1] 0.64, *P*-value[2] 0.24. IPSS: International prostate symptom score, QOL: Quality of life, M-TURP: Monopolar transurethral resection of the prostate, B-TURP: Bipolar transurethral resection of the prostate

Table 2 shows that the post-operative median value of IPSS score in M-TURP and B-TURP was 13 and 12, respectively, which was significantly improved in both the groups as pre-operative median value was 24 and 23, respectively. The post-operative median value of QOL index was 1 in both the groups, which was significantly improved. Hence, IPSS score and QOL index was equally improved in both the groups. There was significant ($P = 0.0001$) difference for IPSS score and QOL index in both the groups, and there was no significant ($P > 0.05$) difference between the two groups.

DISCUSSION

In this study, about one-third of patients of M-TURP 36.6% and 33.9% of B- TURP group were between 61 and 70 years of age. The mean age of patients of M-TURP and B-TURP was 62.08 ± 10.80 and 61.27 ± 10.46 years, respectively. The findings of this study in regard to age of patients were almost similar to the study by Raghuvanshi *et al*. (2019) in which the patient's age ranged from 51 years to 88 years, with a comparable mean age of 67.68 years in the M-TURP group and 70.82 years in the B-TURP group ($P = 0.07$).[15]

This study found that retention of urine was present in 30.5% patients of M-TURP and in 16.9% of B-TURP group. Hematuria was present in 25.4% patients of M- TURP and 22% patients of B-TURP. The retention of urine was higher in this study than the study by Ketabchi *et al*. (2013) in which urinary retention (need for catheterization) was seen in only 6.4% patients of M-TURP.[16] Most patients in our study ignored their LUTS for a long time and only consulted us when they developed acute urinary retention, thus the high incidence of the same in our study.

In this study, post-operative median value of IPSS score in M-TURP and B-TURP was 13 and 12, respectively, which was significantly improved in both the groups as pre-operative median value was 24 and 23, respectively, and post-operative mean value was 12.59 and 12.54, respectively. The post-operative median value of QOL index was 1 in both the groups, and mean value was 1.49 in both the groups which was significantly improved as the median and mean pre-operative QOL index was 4 and 4.23, respectively, in both M-TURP and B-TURP groups. Hence, IPSS score and QOL index were equally improved in both the groups. There was significant ($P = 0.0001$) difference for IPSS score and QOL index in both the groups, and there was no significant ($P > 0.05$) difference between the group. The findings of this study in regard to IPSS was in agreement with the study by Pradiptha *et al*. (2020) who showed that post-operative mean IPSS was 8.10 in M-TURP and 7.57 mean IPSS in B-TURP, there was no statistically significant difference in terms of IPSS between M-TURP and B-TURP resections, mean QOL was 2.53 in M-TURP and 2.73 in B-TURP groups.[17] Erkoç and Beşiroğlu (2020) observed that post-operative mean IPSS was 6.4 in M-TURP and 6.3 in B-TURP. There was significant difference in the mean values of IPSS in both the group from pre-operative to post-operative. However, there was no significance difference between M-TURP and B-TURP.[18] Compared with above studies, post-operative IPSS score was significantly higher in our study but QOL was lower to above studies.

CONCLUSION

Overall, the results of M-TURP and B-TURP are generally similar. IPSS and resection time was similar in both the groups. The complication rate was low in both the group but TUR syndrome occurred only in M-TURP patients. Both methods can be used safely in BPH surgery, but B-TURP is safer in long duration surgery.

REFERENCES

1. Roehrborn CG. Pathology of benign prostatic hyperplasia. Int J Impotence Res 2008;20 Suppl 3:S11-8.
2. McVary K, Roehrborn CG, Avins AL, Barry MJ, Bruskewitz RC, Donnell RF, *et al*. Update on AUA guideline on management of benign prostatic hyperplasia. J Urol 2011;185:1793-803.
3. Kozminski MA WJ, Nelson J, Kent DM. Baseline characteristics predict risk of progression and response to combined medical therapy for benign prostatic hyperplasia. Br J Urol Int 2015;115:308-16.
4. Martin S LK, Haren MT, Taylor AW, Wittert G. Risk factors for progression or improvements of lower urinary tract symptoms in a prospective cohort of men. J Urol 2014;191:130-7.
5. Egan KB. The epidemiology of benign prostatic hyperplasia associated with lower urinary tract symptoms: Prevalence and incident rates. Urol Clin North Am 2016;43:289-97.
6. Gratzke C, Bachmann A, Descazeaud A, Drake MJ, Madersbacher S, Mamoulakis C, *et al*. EAU guidelines on the assessment of non-neurogenic male lower urinary tract symptoms including benign prostatic obstruction. Eur Urol 2015;67:1099-109.
7. Shapiro E, Hartanto V, Lepor H. Quantifying the smooth muscle content of the prostate using double-immunoenzymatic staining and color assisted image analysis. J Urol 1992;147:1167-70.
8. Cornu JN, Cussenot O, Haab F, Lukacs B. A widespread population study of actual medical management of lower urinary tract symptoms related to benign prostatic hyperplasia across Europe and beyond official clinical guidelines. Eur Urol 2010;58:450-6.
9. Gacci M, Ficarra V, Sebastianelli A, Corona G, Serni S, Shariat SF, *et al*. Impact of medical treatments for male lower urinary tract symptoms due to benign prostatic hyperplasia on ejaculatory function: A systematic review and meta- analysis. J Sex Med 2014;11:1554-66.
10. Xie CY, Zhu GB, Wang XH, Liu XB. Five-year follow-up results of a randomized controlled trial comparing bipolar plasmakinetic and monopolar transurethral resection of the prostate. Yonsei Med J 2012;53:734-41.
11. Al-Rawashdah SF, Pastore AL, Salhi YA, Fuschi A, Petrozza V, Maurizi A, *et al*. Prospective randomized study comparing monopolar with bipolar transurethral resection of prostate in benign prostatic obstruction: 36- month outcomes. World J Urol 2017;35:1595-601.
12. Karadeniz MS, Bayazit E, Aksoy O, Salviz EA, Tefik T, Sanli O, *et al*. Bipolar versus monopolar resection of benign prostate hyperplasia: A comparison of plasma electrolytes, hemoglobin and TUR syndrome. Springerplus 2016;5:1739.
13. Bozzini G, Albersen M, Otero JR, Margreiter M, Cruz EG, Mueller A, *et al*. Delaying surgical treatment of penile fracture results in poor functional outcomes: Results from a large retrospective multicenter European study. Eur Urol Focus 2018;4:106-10.
14. Gupta P, Singh N. In: Batra B, editor. How to Write a Thesis and Thesis Protocol. 1st ed. New Delhi: Jaypee Publications; 2014. p. 89-90.
15. Raghuvanshi K, Raval A, Jain DK, Vartak KP, Patil S, Iqbal S, *et al*. Comparative assessment of monopolar versus bipolar transurethral resection of prostate for the management of benign prostatic enlargement. Urol Sci 2019;30:262-5.
16. Ketabchi AA, Ketabchi M, Barkam M. The effect of modified TURP (M- TURP) in intra and postoperative complications. Nephrourol Mon 2013;5:758-61.
17. Pradiptha NT, Duarsa GW, Mahadewa TG. Prospective cohort study comparison of bipolar and monopolar transurethral resection of prostate for benign prostatic hyperplasia: Haemoglobin, sodium levels, and urethral catheter traction application. Int J Res Med Sci 2019;7:95207.
18. Erkoç M, Beşiroğlu H. Comparison of bipolar TURP and monopolar TURP patients who underwent surgery due to BPH. Eur Arch Med Res 2020;36:8-11.

ORIGINAL ARTICLE

Role of computed tomography and fiber-optic bronchoscopy in the evaluation of hemoptysis

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Received: 30-09-2021
Accepted: 17-10-2021

How to cite this article:
Khan J, Saini R, Kumar A, Agrawal R. Role of computed tomography and fiber-optic bronchoscopy in the evaluation of hemoptysis. Int J Adv Integ Med Sci 2021;6(4):37-41.

Source of Support: Nil,
Conflicts of Interest: None declared.

Introduction: Hemoptysis is often an alarming and worrisome symptom for the patient and the physician as well. It has been a frequent manifestation of a variety of diseases. Therefore, diagnostic approach in several cases becoming more challenging. The purpose of this study is to evaluate the causes of hemoptysis with particular reference to diagnostic strategies in patient visiting Rohilkhand Medical College and Hospital (RMCH), Bareilly. **Materials and Methods:** A cross-sectional descriptive study was done in 50 patients with complain of hemoptysis visiting in chest OPD of RMCH. After general physical examination, hematological and biochemical test was carried out. All patients were then subjected to chest X-ray (PA view), ECG and contrast-enhanced computed tomography (CECT) and fiber-optic bronchoscopy (FOB). Data analysis was done by Chi-square test and *t*-test**. Results:** CECT diagnosed CA in 33 (66%) and bronchiectasis in 13 (26%) cases and normal finding in 2 (4%) cases. FOB findings are normal in 8 (16%) cases, showed growth with obstruction in 21 (42%) and growth without obstruction in 8 (16%) cases. In 13 (26%) cases, bronchoscopy was not done. **Conclusion:** Both CECT and FOB are found to be useful diagnostic tools in evaluating the cause of hemoptysis. FOB is useful where CT is not confirmative.

KEYWORDS: Carcinoma, computed tomography, diagnostic tools, fiber-optic bronchoscopy, hemoptysis, tuberculosis

INTRODUCTION

Hemoptysis can be defined as the expectoration of blood derived from the lungs or bronchial tubes as a result of pulmonary or bronchial hemorrhage. It can be divided into two types as non-massive or massive depending on the volume of blood loss. The hemoptysis is generally caused by acute and chronic bronchitis, pneumonia, and tuberculosis (TB). Infection, cancer, and pulmonary venous hypertension are the other causes of hemoptysis. In 7–34% of patients with hemoptysis, no identifiable cause can be found after careful evaluation (Reisz *et al*., 1997; Set *et al*., 1993; Herth *et al*., 2001).[1-3] If the cause of hemoptysis is idiopathic, then we can say that the prognosis is usually good and within 6 months, the majority of the patients will show resolution. However, the previous data clearly show that the cause of hemoptysis is mainly lung cancer in individuals who are smokers and having age more than 40 years.

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Cause of Hemoptysis in Children

- Lower respiratory tract infection is found of be the most common cause of hemoptysis in children
- The other cause may include – foreign body aspiration in young age group, bronchiectasis may occur in the similar age group of individuals who are having cystic fibrosis
- Trauma and injury direct to the chest may cause hemoptysis as if may cause pulmonary contusion and hemorrhage.[4-6]

Diagnostic Approach

There are enormous global, geographical variations in the causes of hemoptysis. In the west, for example, malignancy

and non-tuberculous causes are most common, although the social mix of the population is an important variable. Human immunodeficiency virus-related TB is also on the increase. Within poorer Third World countries, however, TB is often the most likely cause (Broomhead, 2007).[7] The generally followed diagnostic approach includes history taking and clinical examination followed by investigations. A brief review of this approach is as follows:

History Taking

Important clues to the diagnosis can be gained from a carefully taken history including smoking and tobacco history, although confirmatory investigations are almost always necessary. Patient history can help identify the anatomic site of bleeding, differential between hemoptysis and pseudohemoptysis, and narrow the differentiate diagnosis. Factors such as age, nutrition status, and comorbid conditions can assist in the diagnosis and management of hemoptysis. Table 1 shows the list of diagnostic clues obtained through physical history:

Clinical Examination

Physical examination needs to be thorough and extensive. The most important immediate need is to assess whether the patient's condition is serious enough to demand emergency hospital admission for resuscitation. Cyanosis, severe dyspnea, and cardiopulmonary collapse all indicate that this is likely to be the case (Broomhead, 2007).[7] Examination of the nasal cavity and oropharynx will help to exclude "non-pulmonary causes for the bleeding (pseudohemoptysis)." Clubbing of the fingers may be present in chronic pulmonary disease or lung cancer, whereas evidence of recent weight loss or muscle wasting may be significant. Supraclavicular lymph nodes, jaundice, or hepatomegaly may also suggest an underlying malignancy. Deep vein thrombosis in a calf muscle is often difficult to exclude but is classically associated with pain, swelling, and Homans sigh (pain on flexing the foot).

Abnormal finding within the chest may include reduced air entry, rales, wheezing, and basal crepitations. Dullness on percussion may suggest consolidation or a pleural effusion, whereas the presence of a diastolic murmur may indicate mitral stenosis. An elevated jugular venous pressure, a gallop rhythm, or peripheral edema may indicate cardiac failure and pulmonary edema as the cause of the problem (Broomhead, 2007).[7]

Table 1: Diagnostic clues in hemoptysis: Physical history

The various clues in hemoptysis for diagnosis

- If hemoptysis is associated with menses cause may be catamenial
- If hemoptysis is associated with dyspnea on exertion, fatigue, orthopnea, PND, pink frothy sputum cause may be congestive heart failure
- If hemoptysis is associated with prolonged intake of NSAIDs cause may be drug induced
- If hemoptysis is associated with fever, cough, and expectoration cause may be upper/lower respiratory tract infections
- If hemoptysis in individuals (age>40 years, smoker, male) cause may be lung carcinoma
- If hemoptysis is associated with foul smelling, copious sputum cause may be bronchiectasis

PND: Paroxysmal nocturnal dyspnea

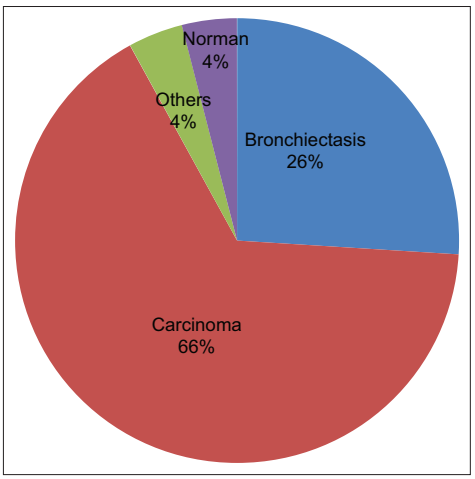


Figure 1: Contrast-enhanced computed tomographic findings

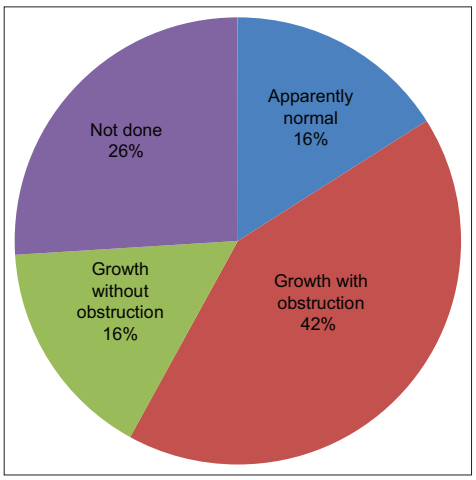


Figure 2: Fiber-optic bronchoscopic findings

Table 2: Distribution of patients according to contrast-enhanced computed tomographic findings

S. No.	Variable	No. of patients	Percentage
1	Bronchiectasis	13	26.0
2	Carcinoma	33	66.0
3	Others	2	4.0
4	Normal	2	4.0

Table 3: Distribution of patients according to fiber-optic bronchoscopy findings

S. No.	Variable	No. of patients	Percentage
1	Apparently normal	8	16.0
2	Growth with obstruction	21	42.0
3	Growth without obstruction	8	16.0
4	Not done	13	26.0

Diagnostic Evaluation

The chart presenting an algorithm for the evaluation of non-massive hemoptysis. After a careful history examination, a chest radiography should be obtained.

If the cause of hemoptysis is not diagnosed by usual examination and investigation, then further we have to move over advanced radiological imaging as CT thorax or we can perform bronchoscopy for accurate diagnosis. In view of the previous data, we can easily predict the prognosis of individual as poor (age >40 years, sex male, and smokers with 40 pack-years or more and hemoptysis for more than 1 week duration) in such patients, the fiber-optic bronchoscopy (FOB) is play an important role in diagnosing or to rule out malignancy.[8]

The advantage of FOB is not only as direct visualization of the endobronchial disease but at the same time it will also permits for BAL, brushing, or tissue biopsy for further evaluation and it will serve as preferred tool as it also provides therapy in case of massive bleeding and is useful for excluding malignancy in high-risk patients.[9,10] Its role in hemoptysis continues to evolve, and further studies are being done to evaluate its effect on patient management and outcome.

MATERIALS AND METHODS

The present study is carried out in the Department of Pulmonary Medicine, Rohilkhand Medical College and Hospital, Bareilly. It is a tertiary care teaching hospital with well-equipped state of the art infrastructure and a well-trained human resource. Study population includes all the male female, aged >20 years patients with symptoms of hemoptysis. Patients having complaints of hemoptysis following trauma, patient with blood dyscrasias, thrombocytopenia, and sputum positive for AFB have been excluded from this study.

Procedure of Study

After permission of the Institutional Ethical Committee, an informed consent is obtained from all the participants. After taking history of the patient, general physical examination followed by thorough chest examination, cardiovascular,

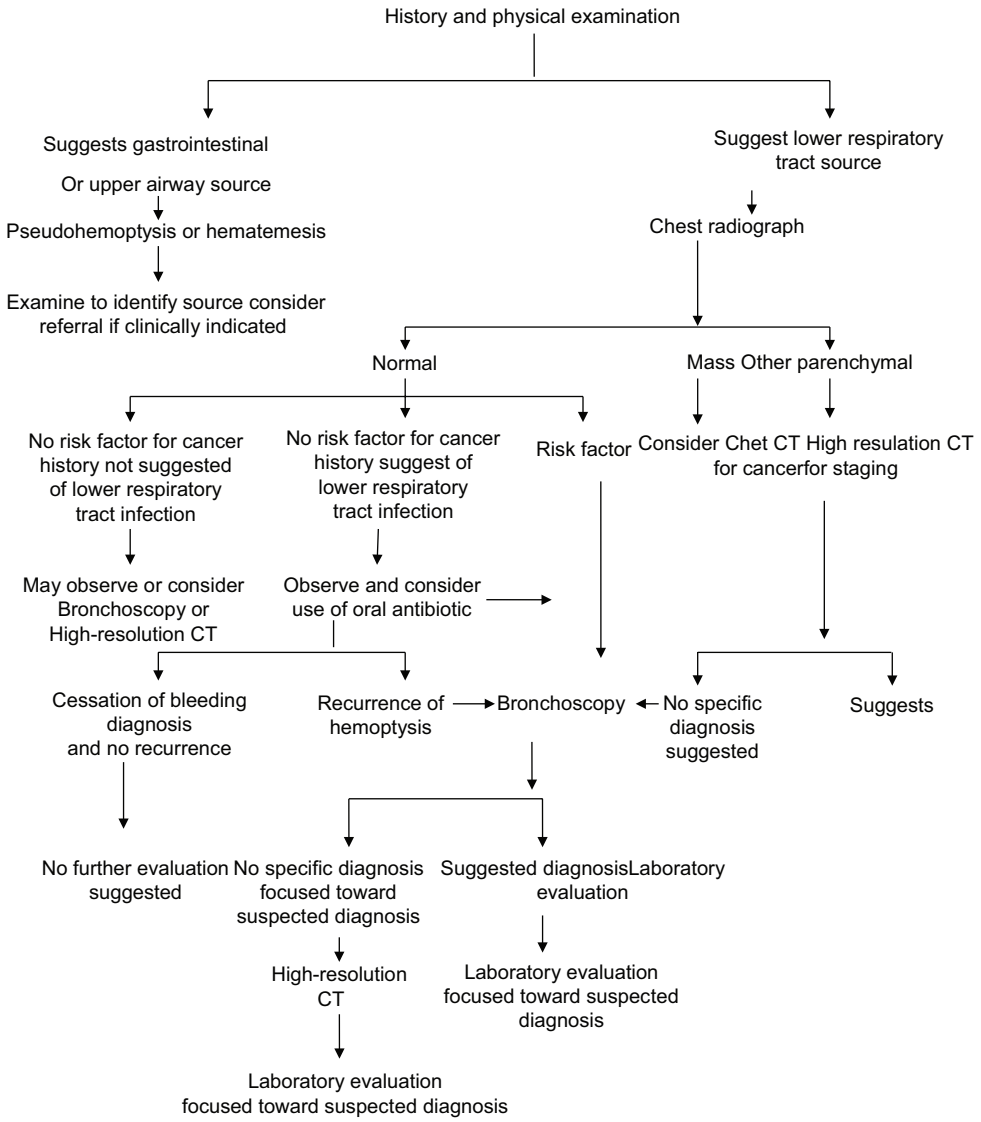
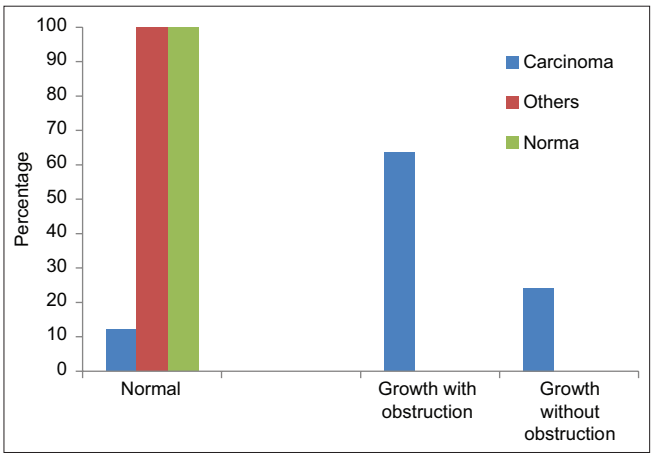


Table 4: Association between CECT finding and demographic factors

S. No.	Factors	CECT findings								Statistical significance	
		Bronchiectasis (*n*=13)		Carcinoma (*n*=33)		Other (*n*=2)		Normal (*n*=2)		x	p
		No.	%	No.	%	No.	%	No.	%		
1.	Age (year)									28.84	<0.001
	<30	4	66.7	0	0.0	0	0.0	2	33.3		
	30–50	7	33.3	14	66.7	0	0.0	0	0.0		
	>50	2	8.7	19	82.6	2	8.7	0	0.0	2.50	0.476
2.	Gender										
	Male	9	22.0	28	68.3	2	4.9	2	4.9		
	Female	4	44.4	5	55.6	0	0.0	0	0.0		
3.	Religion									6.69	0.082
	Hindu	10	34.5	17	58.6	0	0.0	2	6.9		
	Muslim	3	14.3	16	76.2	2	9.5	0	0.0		
4.	Occupation									54.30	<0.001
	Farmer	9	26.5	23	67.6	2	5.9	0	0.0		
	Housewife	4	44.4	5	55.6	0	0.0	0	0.0		
	Businessman	0	0.0	4	100.0	0	0.0	0	0.0		
	Laborer	0	0.0	1	100.0	0	0.0	0	0.0		
	Employee	0	0.0	0	0.0	0	0.0	2	100.0		

Table 5: Association between CECT finding and fiber-optic bronchoscopy finding

S. No.	Fiber-optic bronchoscopy finding	CECT finding						Statistical significance	
		Carcinoma (*n*=33)		Other (*n*=2)		Normal (*n*=2)		x^2	p
		No.	%	No.	%	No.	%		
1.	Normal	4	12.1	2	100.0	2	100.0	16.26	0.003
2.	Growth with obstruction	21	63.6	0	0.0	0	0.0		
3.	Growth without obstruction	8	24.2	0	0.0	0	0.0		



abdominal, and central nervous system is done. Hematological and biochemical test is also carried out. After that all the patients were then subjected to chest X-ray (PA view), ECG was done for the confirmatory diagnosis and contrast-enhanced computed tomography (CECT) chest was performed using a 16-slice multidetector CT scan unit. All those cases in which no confirmatory diagnosis could be made out by CT were subjected to FOB.

The data collected are analyzed using Chi-square test. Parametric evaluation is done using analysis of variance and independent sample "t" test. The confidence level of the study was kept at 95% hence "p" value is less than 0.05 which indicates statistically significant association.

OBSERVATION AND RESULTS

CECT revealed cause of hemoptysis to be carcinoma in 33 (66%) patients. A total of 13 (26%) patients had bronchiectasis, two were categorized as other causes (one with peripherally located mass and another mediastinal mass) while remaining 2 (4%) cases were found to be normal on CECT [Figure 1 and Table 2].

FOB was not done in 13 (26%) cases confirmed as bronchiectasis in CECT. It revealed normal finding in 8 (16%) patients. Growth with obstruction was observed in 21 (42%) patients and growth without obstruction was observed in remaining 8 (16%) patients [Figure 2 and Table 3].

Associations

Tables 4 and 5 show association between CECT finding with demographic, clinical, and other diagnostic findings:

On the basis of the present study, the following conclusion has been drawn.

1. CECT diagnosed carcinoma in 33 (66%) and bronchiectasis in 13 (26%) cases, and normal findings in 2 (4%) cases. In one case, each peripherally located mass and mediastinal mass was observed
2. FOB was normal in 8 (16%) cases, showed growth with obstruction in 21 (42%) and growth without obstruction in 8 (16%) cases. In 13 (26%) cases, bronchoscopy was not done
3. Histopathologically, 3 (9.1%) cases have adenocarcinoma, 22 (66.7%) have squamous cell carcinoma, and 5 (15.2%) have small cell carcinoma. There were 3 (9.1%) cases with other findings (one case each of poorly differentiated carcinoma, atypical cell, and mediastinal lymphoma, respectively). Thus, confirming the positive findings of CECT in all the cases. Prevalence of carcinoma is higher in male of older ages. Lung cancer is more common in farmer, businessmen, and laborers as compared to housewives and employees.

AQ4

DISCUSSION

The diagnostic approaches for ascertaining cause of hemoptysis include both invasive (bronchoscopy, biopsy) as well as non invasive (CT and other imaging techniques). In recent years CT has emerged as a useful diagnostic modality for diagnosis of causes of thoracic abnormalities and has shown promising results in evaluation of hemoptysis.[11] In this study we have evaluated the usefulness of CT in 50 patients for diagnosis of hemoptysis and its limitations by carrying out fibroptic bronchoscopy, where CT failed to deliver a confirmative diagnosis.

In present study CECT revealed high burden of carcinoma (66%) followed by bronchiectasis (26%). Although most of the studies in past have found the high prevalence of tuberculosis, however no patient with tubercular etiology was found in our study, which might be attributed to the exclusion of sputum AFB positive cases. One of the reasons for high burden of carcinoma for present study could be the high prevalence of smoking and biomass fuel exposure. Heavy smoking is a major risk for lung cancer in both active and smokers.[12]

On histopathology of 33 cases diagnosed as carcinoma by CECT all the cases were confirmed to be carcinoma thus indicating high specificity of CECT in diagnosis of carcinoma. High utility of CECT in diagnosing of carcinoma was also reported Sharma *et al.*[13] In present study, we found that CECT provides excellent information and it should be used as a primary diagnostic tool in evaluating cases of hemoptysis as it is non invasive in nature. Fiberoptic bronchoscopy improves the results of CECT especially in cases with intraluminal growth for making histopatholgical diagnosis.

Author Queries???
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CONCLUSION

The present study corroborated the observation of the previous workers that CT is a useful diagnostic modality in cases of hemoptysis and helps in investigating the reason of unexplained hemoptysis. In the present study, we found that CECT provides excellent information and it should be used as a first diagnostic tool in evaluating the causes of hemoptysis as it is non-invasive in nature. FOB improves the results of CECT, especially in cases with intraluminal growth for making histopathological diagnosis.

REFERENCES

1. Reisz G, Stevens D, Boutwell C, Nair V. The causes of hemoptysis revisited. A review of the etiologies of hemoptysis between 1986 and 1995. Mo Med 1997;94:633-5.
2. Set PA, Flower CD, Smith IE, Chan AP, Twentyman OP, Shneerson JM. Hemoptysis: Comparative study of the role of CT and fiberoptic bronchoscopy. Radiology 1993;189:677-80.
3. Herth F, Ernst A, Becker HD. Long term outcome and lung cancer incidence in patients with hemoptysis of unknown origin. Chest 2001;120:1592-4.
4. Adelman M, Haponik EF, Bleecker ER, Britt EJ. Cryptogenic hemoptysis. Clinical features, bronchoscopic findings, and natural history in 67 patients. Ann Intern Med 1985;102:829-34.
5. Pianosi P, Al Sadoon H. Hemoptysis in children. Pediatr Rev 1996;17:344-8.
6. Godfrey S. Hemoptysis in children. Pediatr Pulmonol Suppl 2004;26:177-9.
7. Broomhead C. Hemoptysis. Med Update 2007;15:46-8.
8. Gregory RK, Chang J, Singh R, Powles TJ. Clubbing, arthralgia and hemoptysis in a patient with metastatic carcinoma of the breast. Ann Oncol 1996;7:756-7.
9. Colice GL. Detecting lung cancer as a cause of hemoptysis in patients with a normal chest radiograph: Bronchoscopy vs CT. Chest 1997;111:877-84.
10. Tasker AD, Flower CD. Imaging the airways. Hemoptysis, bronchiectasis, and small airways disease. Clin Chest Med 1999;20:761-73.
11. Mcguineess G, Beacher JR, Harkin TJ, garay SM, Rom WN, Naidich DP. Hemoptysis: Prospective high resolution CT/ bronchoscopic correlation. Chest 1994;105:1155-62.
12. Papadopoulos A, Guida F, Leffondré K, Cénée S, Cyr D, Schmaus A, *et al.* Heavy smoking and lung cancer: Are women at higher risk? Result of the ICARE study. Br J Cancer 2014;110:1385-91.
13. Sharma R, Tripathi M, D'Souza M, Jaimini A, Saw SK, Singh D, *et al.* The importance of 18F-FDG PET/CT, CT and X-rays in detecting primary stage III A lung cancer and the incidence of extra thoracic metastases. Hell J Nucl Med 2009;12:22-5.

ORIGINAL ARTICLE

Histopathological pattern of lung carcinoma at tertiary care center – A three-year study, RMCH, Bareilly

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Received: 24-10-2021
Accepted: 07-11-2021

How to cite this article:
Agrawal R, Lochab S, Basra P. Histopathological pattern of lung carcinoma at tertiary care center – A three-year study, RMCH, Bareilly. Int J Adv Integ Med Sci 2022;7(1):42-45.

Source of Support: Nil,
Conflicts of Interest: None declared.

Introduction: Lung cancer is one of the most frequent causes of cancer-related deaths worldwide. In India, it accounts for up to 9.3% of all cancer-related deaths in both sexes. Adenocarcinoma, squamous cell carcinoma, large cell, small cell, and undifferentiated carcinoma are the most common histological types that account for more than 90% of all the cases of lung cancers. Aim: The objective was to assess the histopathological pattern of primary malignant lung tumors at a tertiary care hospital over a 3 year period (2018–2020). Results: A total of 122 cases of lung carcinoma studied included 90 males and 32 females, in Respiratory Medicine Department, Rohilkhand Medical College and Hospital, Bareilly. Cases detected by biopsy 82 (67%), fine-needle aspiration cytology (FNAC) 15 (12.29%), and 25 (20.49%) on pleural fluid examination. Patients diagnosed on pleural fluid analysis were excluded as their histopathological type could not be evaluated. Among 97 patients, most common was squamous cell carcinoma 53% followed by adenocarcinoma in 23%, small cell carcinoma 8%, large cell carcinoma 2%, and poorly differentiated 14%. Among 100 smokers, most common was squamous cell Ca 70 (70%). Among 76 nonsmokers, most common type was AdenoCa 30 (39.5%). Conclusion: According to the studies, adenocarcinoma was the most common histological type but at our center, squamous cell carcinoma was the most predominant type.

KEY WORDS: Histopathological pattern, lung carcinoma, squamous cell carcinoma, male predominant, dyspnea, smoking, adenocarcinoma, three year

INTRODUCTION

Lung cancer is one of the most common causes of cancer-related deaths worldwide. In India, lung cancer accounts for 9.3% of all cancer-related deaths in both sexes. Worldwide, cases of lung carcinoma are on track to rise by 38% to 2.89 million by around 2030. The most important risk factor for causation of lung cancer is considered to be tobacco smoking. Additional factors include environmental exposure to radon, asbestos, and metals such as chromium, cadmium, and arsenic; few organic chemicals; radiation; coal smoke; and indoor emission of burning fuel.

Adenocarcinoma, squamous cell carcinoma, large cell carcinoma, small cell, and undifferentiated carcinoma are the most common histological types which account for more than up to 90% of all cases of lung carcinoma. In the initial decades when smoking lead to epidemic of lung carcinoma, squamous cell carcinoma was observed most commonly. After steadily increase in number of cases during the period 1973–1987, adenocarcinoma replaced squamous cell carcinoma as the most frequent type. Significant change has taken place in the incidence of lung cancer by histologic type. One factor is the reduction in the average nicotine and tar delivery of the cigarettes. Other major component for the decreased smoke emission is correlated to the changes in the composition of the cigarette tobacco blend and cigarettes with filter tips. However, the low-yield cigarette smokers compensate for this low delivery of nicotine by inhalation of smoke more

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deeply and smoking more intensely. This leads to exposure of the peripheral lung to increased amount of the smoke carcinogens which are suspected cause for lung adenocarcinoma.[1] Moreover, the more intense smoking leads to rise in N-nitrosamines in the smoke by 2–3-fold that causes adenocarcinoma of the lung.[2] This idea that deeper and more intense smoking causes primarily adenocarcinomas in more distant parts of the lung is supported by the data which show that the most of the lung neoplasms among the smokers of pipes and cigars are squamous cell carcinomas which arise from major bronchi.[3] The objective of this study was to assess the histopathological pattern of primary malignant tumors of lung at a tertiary care hospital among smokers and non-smokers of both sexes.

MATERIALS AND METHODS

This retrospective study was conducted on 122 patients in Rohilkhand Medical College, Bareilly.

The study was done from January 2018 to December 2020, on patients whose diagnosis was confirmed on biopsy, cytology or fine needle aspiration cytology (FNAC). The routine history taking and examination were done to make the diagnosis of carcinoma. Investigations such as chest X-ray and computed tomography (CT) scan were done before confirming the diagnosis of lung cancer by Biopsy- Bronchoscopic/CT guided/ USG guided/Pleural biopsy, FNAC- USG-guided/CT-guided, and pleural fluid analysis for malignant cells. All the patients with confirmed diagnosis of lung carcinoma were included in the study. The Ethical Committee approval from the institution was taken for conducting this study. The data were coded and entered, it's clearing and compiling was done on a Microsoft Excel spreadsheet and then it was imported into Statistical Package for the Social Sciences (SPSS) version 23 for statistical analysis. Data were analyzed by applying frequency, percentage, mean, and standard deviation.

OBSERVATIONS AND RESULTS

Out of 122, number of cases detected by biopsy are – 82 (67%), FNAC are 15 (12.29%), and 25 (20.49%) on pleural fluid examination [Figure 1]. Patients detected on pleural fluid examination were excluded from the study as we could not evaluate the type of carcinoma in these patients.

Out of total 97 patients, the most common histological type of tumor in both sexes was squamous cell carcinoma in 53%, followed by adenocarcinoma in 23% [Figure 2], small cell carcinoma in 8%, poorly differentiated in 14%, and large cell carcinoma in 2% (Type 2).

Males constituted 74% (90 cases) and females 26% (32 cases) of all malignant primary lung tumors. In our study, the male to female ratio 3:1 is which could be compared with Jindal S.K's study which reports the ratio as 4.5:1. Both among males and females, the most common type was squamous cell carcinoma [Figures 3 and 4]

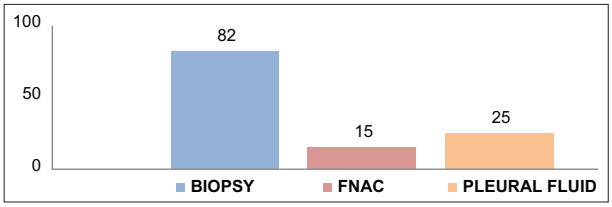

Figure 1: Diagnostic modalities for Lung Ca

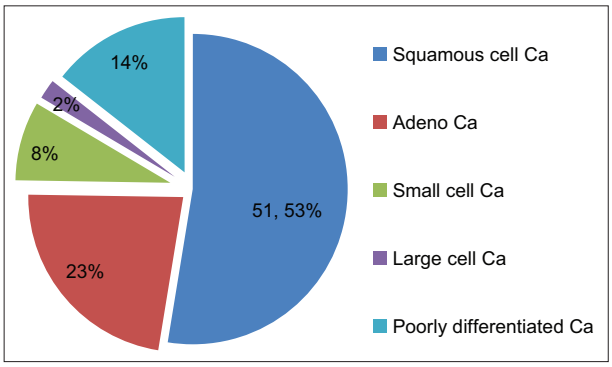

Figure 2: Histologic Type

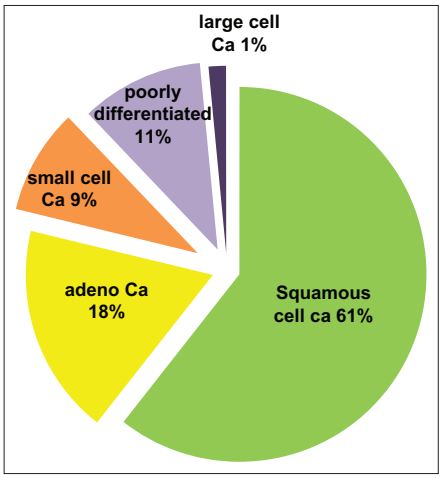

Figure 3: Histopathological distribution in males

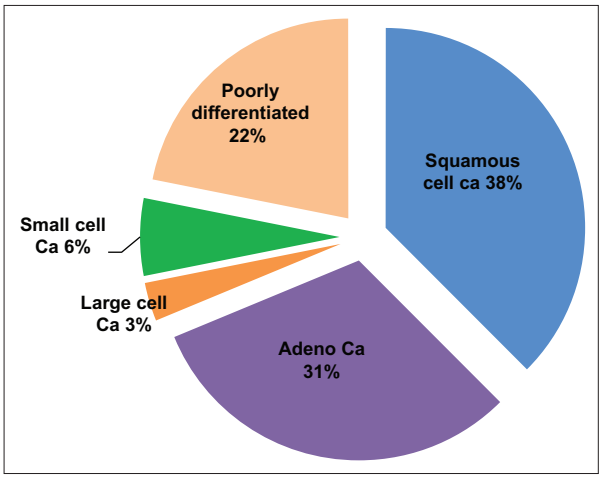

Figure 4: Histopathological distribution among females

In our study, the age range of the lung carcinoma incidence was falling in between 30 and 85 years with maximum number of

cases seen between 56 and 65 years (40%), followed by 46 and 55 years (31%). Least incidence rate was seen in the age group of 76–85 years (2%) [Figure 5]. The overall mean age of patients of primary lung cancer was 56 years. In Jindal S.K's study, 40.2% of patients were <50 years of age. Squamous cell carcinoma was most predominant in the age group of 56–65 years [Figure 6]. No significant difference in histopathological type was observed in other age groups. This observation needs to be further studied on a larger scale of population.

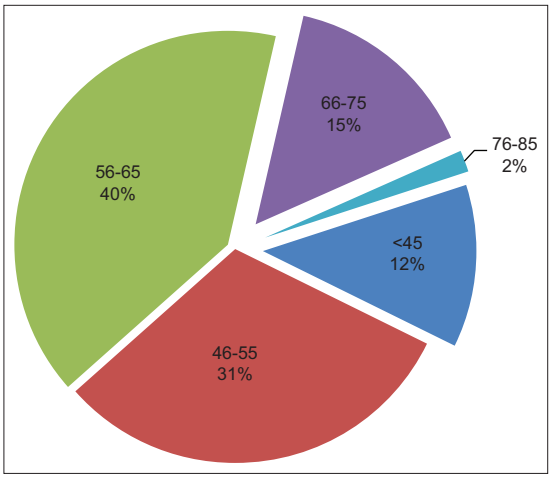

Figure 5: Age distribution in Lung Ca cases

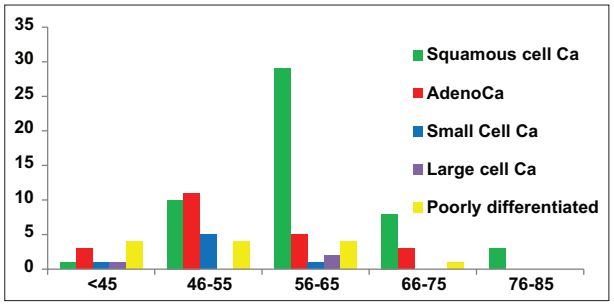

Figure 6: Age-wise distribution of histopathological pattern

Study constituted 70 smokers and 22 non-smokers. All histological types were strongly associated with smoking, though the risks were considerably lower for AdCa (13%) than for SqCC (71%). Among smokers, the most common was squamous cell Ca (71%) [Figure 7]. Pesch *et al*. concluded that AdCa was the most common subtype among never smokers and among women. The greater the amount smoked, the greater the proportion of SqCC and SCLC relative to AdCa.

DISCUSSION

Over the few years, there has been rising trend of adenocarcinoma. Among many countries, AC has surpassed SCC as the most common histologic variant of lung cancer. This could be attributable to the changed smoking pattern and increased incidence of lung cancer among women and non-smokers. We found at our center that squamous cell carcinoma (48%) is predominant than adenocarcinoma (25%) as reported in other Indian studies and attributes these findings to higher number of smokers in our study. The distribution is dissimilar to the most Western studies, where adenocarcinoma is now the most frequent form of lung cancer which is probably due to the trend of smoking filtered cigarettes. Overall, it appears that the clinical spectrum of lung cancer in our study group is identical to other Indian studies.[4-8]

CONCLUSION

It seems that the clinicopathological profile of the patients with lung cancer has undergone observable changes over the past few decades, especially in the rise in the incidence of adenocarcinoma and their common presence in smokers. This difference in histopathology may be due to the fact that smoking is less prevalent among women in India as opposed to the West, where it is rising; and urbanization, that exposes the patient to other carcinogens, risk factors or a complex interaction among gender, race, and smoking status in West.

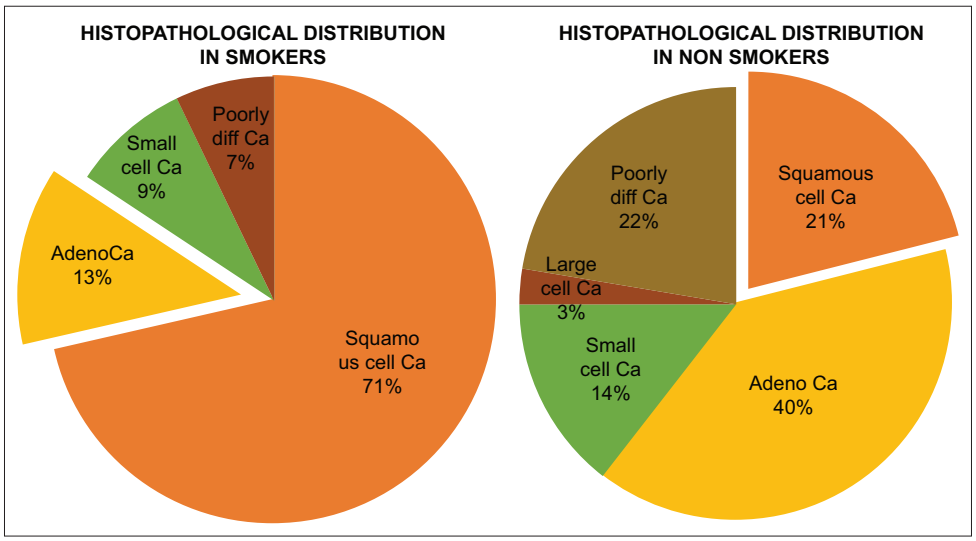

Figure 7: Histopathological distribution in smokers and non-smokers

REFERENCES

1. Lubin JH, Blot WJ, Berrino F, Flamant K, Gillis CR, Kunze M, *et al*. Patterns of lung cancer risk according to type of cigarette smoked. Int J Cancer 1984;33:569-76.
2. Hecht SS, Hoffmann D. Tobacco-specific nitrosamines, an important group of carcinogens in tobacco and tobacco smoke. Carcinogenesis 1989;9:875-84.
3. Higgins IT, Mahn CM, Wynder EL. Lung cancer among cigar and pipe smokers. Prev Med 1988;17:116-28.
4. Ramani V, Bijit C, Vinu S, Belagutti JS, Radheshyam N. Clinicopathological profile of lung cancers at an institute from South India a record based retrospective cohort study. Adv Lung Cancer 2020;9:41.
5. Rawat J, Sindhwani G, Gaur D, Dua R, Saini S. Clinico-pathological profile of lung cancer in Uttarakhand. Lung India 2009;26:74-6.
6. Jindal SK, Behera D. Clinical spectrum of primary lung cancer review of Chandigarh experience of 10 years. Lung India 1990;8:94-8.
7. Dey A, Biswas D, Saha SK, Kundu S, Kundu S, Sengupta A. Comparison study of clinicoradiological profile of primary lung cancer cases: An Eastern India experience. Indian J Cancer 2012;49:89-95.
8. Mural AN, Radhakrishnan V, Ganesan TS, Rajendranath R, Ganesan P, Selvaluxmy G, *et al*. Outcomes in lung cancer: 9-year experience from a tertiary cancer Center in India. J Clin Oncol 2017;3:459-68.

Case Report

Surgical reconstruction of acromioclavicular joint dislocation (Rockwood Type III)

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Received: 16-10-2021
Accepted: 01-11-2021

How to cite this article:
Nagar MM, Garg P, Husain I, Mittal S, Gupta D. Surgical reconstruction of acromioclavicular joint dislocation (Rockwood Type III). Int J Adv Integ Med Sci 2021;6(4):46-48.

Source of Support: Nil,
Conflicts of Interest: None declared.

Introduction: The management of acute acromioclavicular joint (ACJ) injuries especially of type III is still controversial. **Methods:** In this study the results of ACJ reconstructions using modified weaver Dunn procedure along with post-operative physiotherapy was analysed. Overall, the patient was evaluated clinically and radiographically over the course of 3 months (range). The patient underwent a modified Weaver Dunn method with additional coracoacromial ligament transposition and resection of distal clavicle. (Coracoacromial ligament release from acromion and attached at distal clavicle. **Results**: In terms of the degree of ACJ-reduction, the number of complications, and patient satisfaction, a comparison of the overall findings demonstrated a much better surgical management outcome. **Conclusion**: Our findings show that surgical reconstruction of type III ACJ injuries avoids the poor clinical outcomes in contrast with non-surgical methods.

KEY WORDS: Acromioclavicular dislocation, modified Weaver-Dunn, Rockwood III

INTRODUCTION

Rockwood classified acromioclavicular joint (ACJ) dislocations into grades I to VI based on the direction and amount of clavicular displacement. Grade I and II lesions are generally thought to be benign and can be treated conservatively.[1] There is also widespread agreement that class IV to VI injuries should be operated on. Nonetheless, the discussion over whether to treat type III ACJ injuries with conservative or surgical treatment is still ongoing. The incidence of complications varies depending on the desired surgical treatment for type III injuries, and can sometimes result in a loss of shoulder function. In contrast to that a conservative management may result in an excellent and painless shoulder function. However, failures after conservative treatment, still suffering from chronic instability and pain, may require surgical repair because of an inferior clinical outcome.[1]

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CASE REPORT

A 28 year old male patient presented in outpatient department with complain of inability to lift heavy objects and pain on/off in left shoulder joint with history of trauma to left shoulder due to fall from bike 1 month back. Patient was then managed outside conservatively with arm pouch sling and oral medications including anti-inflammatory, analgesics but not relieved and presented in RMCH for further management. On physical examination deformity was present at acromioclavicular (AC) junction and range of motion was normal at shoulder joint. Patient's blood investigations were within normal limits, on radiological X-rays suggestive of Rockwood type 3 AC post dislocation Figure 2a and hence planned for surgical reduction

as Open reduction and internal fixation with modified Weaver Dunn technique with distal clavicle resection of 8 mm Figure 1 and post op X-ray Figure 2b and physiotherapy was required. Expected outcome was deformity correction, reduction of AC disruption and strengthening of the shoulder joint. After 3 months of follow up it was observed that patient started lifting weight with less effort and pain as earlier and is further improving and strengthening the shoulder joint.

DISCUSSION

The optimum treatment for acute AC dislocation is still a point of contention. The best outcome may only be achieved if the AC joint is repaired anatomically as accurately as possible, according to proponents of operational treatment. This is because, following conservative treatment, the remaining dislocation may cause prolonged discomfort.[2-4] These concerns are countered by the good results that have been recorded in recent years after conservative treatment.[5-7] These authors noted that, while conservative treatment can yield equivalent results, it does not expose the patient to the hazards associated with surgery. In their meta-analysis of the matter, Phillips *et al*.[8] eventually advocated against surgical treatment. The absence of utilization of the Rockwood classification of AC joint injuries in terms of selective criteria is a key shortcoming in the ongoing topic of AC dislocation treatment.[5-9] Even if all of the injuries in issue are classed as Tossy type III, the informative value of the results of a study on this topic is significantly reduced if several types of Rockwood injuries are included in the comparative study groups. As a result, we focused solely on Rockwood type III injuries. Although it is possible to evaluate different surgical approaches, it should be noted that when using meta-analysis to compare surgical treatment to conservative treatment, conclusions must be stated with caution. The stated results, the concept, the benefits, and the downsides of various

Figure 1: Intraoperative images (a-c) and postoperative stitch line (d)

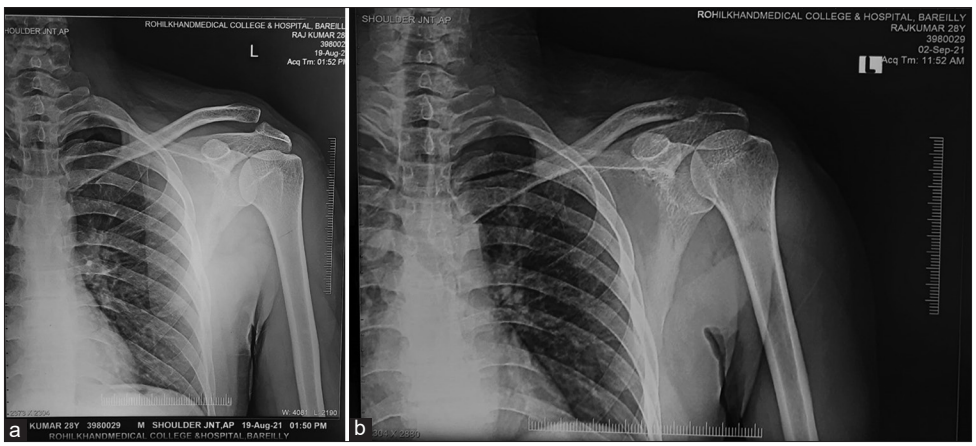

Figure 2: Pre-operative X-ray AP view (a) and Post-operative X-ray AP view (b)

surgical methods differ significantly. As a result, things should not be thrown together at random. The need for a second procedure to remove the implant may be considered a disadvantage when compared to surgical techniques using polydioxanone bands for augmentation and reduction. The formation of stiff scar tissue is required for the healing of injured coracoclavicular ligaments. Because this is the most important aspect, a lack of mechanical stability in the coracoclavicular ligaments will result in long-term discomfort, regardless of treatment. Although it is known from the literature that a complete anatomic reduction is not required for restoring normal shoulder function, the degree of displacement in type III ACJ dislocations does not appear to have a significant impact on the end outcome.

CONCLUSION

To manage Rockwood type III ACJ dislocation, Modified weaver Dunn procedure accompanied with physiotherapy is a good option.

REFERENCES

1. Rolf O, von Weyhern AH, Ewers A, Boehm TD, Gohlke F. Acromioclavicular dislocation Rockwood III-V: Results of early versus delayed surgical treatment. Arch Orthop Trauma Surg 2008;128:1153-7.
2. Folwaczny EK, Yakisan D, Sturmer KM. The Balser plate with ligament suture. A dependable method of stabilizing the acromioclavicular joint. Unfallchirurg 2000;103:731-40.
3. Mayr E, Braun W, Eber W, Ruter A. Treatment of acromioclavicular joint separations. Central Kirschner-wire and PDS-augmentation. Unfallchirurg 1999;102:278-86.
4. Tossy JD, Mead NC, Sigmond HM. Acromioclavicular separations: Useful and practical classification for treatment. Clin Orthop Relat Res 1963;28:111-9.
5. Larsen E, Bjerg-Nielsen A, Christensen P. Conservative or surgical treatment of acromioclavicular dislocation. A prospective, controlled, randomized study. J Bone Joint Surg Am 1986;68:552-5.
6. Phillips AM, Smart C, Groom AF. Acromioclavicular dislocation: Conservative or surgical therapy. Clin Orthop Relat Res 1998;353:10-7.
7. Taft TN, Wilson FC, Oglesby JW. Dislocation of the acromioclavicular joint. An end-result study. J Bone Joint Surg Am 1987;69:1045-51.
8. Bannister GC, Wallace WA, Stableforth PG, Hutson MA. The management of acute acromioclavicular dislocation. A randomised prospective controlled trial. J Bone Joint Surg Br 1989;71:848-50.
9. Walsh M, Peterson DA, Shelton G, Neumann RD. Shoulder strength following acromioclavicular injury. Am J Sports Med 1985;13:153-8.